CalComp

1040GT Series
User's Guide

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1040GT Series
User's Guide

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WARNING

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing devices pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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IMPORTANT SAFETY INSTRUCTIONS

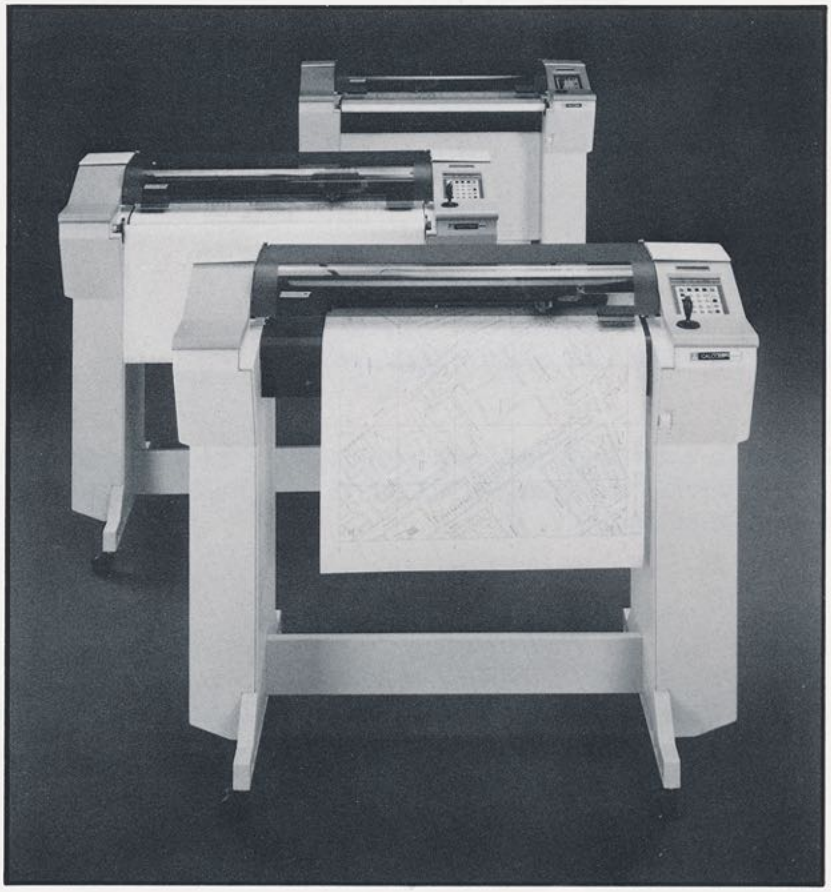
1. Read all of these instructions.
2. Save these instructions for later use.
3. Follow all warnings and instructions marked on the product.
4. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
5. Do not use this product near water.
6. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
7. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
8. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
9. This product is equipped with a three-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
10. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
11. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
12. Never push objects of any kind into the product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
13. Except as explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.
14. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    A. When the power cord or plug is damaged or frayed.
    B. If liquid has been spilled into the product.
    C. If the product has been exposed to rain or water.
    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    E. If the product has been dropped or the cabinet has been damaged.
    F. If the product exhibits a distinct change in performance, indicating a need for service.

1040GT USER'S GUIDE
INTRODUCTION AND CONTENTS

INTRODUCTION

The 1040GT plotters combine all the benefits of low-cost and high-quality pen plotting with increased speed and greater ease of use.

These plotters are upright units, featuring an eight-pen turret with built-in pen capping, an intelligent control panel, built-in controller, and ROMPACK firmware for easy upgrading. The 1040GT models are sophisticated, easy-to-use devices for use on a variety of systems.



NOTE

Throughout this User's Guide, the word "media" is used to describe the various materials the plotter can plot on. These include bond, vellum, polyester film and ClearPlot® .

The 1043GT uses cut sheet media exclusively. The Model 1042GT plots on cut sheet media and has the added capability to plot on roll media, using a passive roll feed system and a grit band drum. The 1044GT plots on both cut sheet and roll media, but uses an active roll feed system with a sprocketed drum and twin vacuum cannisters to achieve this. All three models run at a maximum speed of 24 inches per second (ips) with slower speeds programmable to accommodate a variety of pen and media types.

SPECIFICATIONS

Plot Size

Model	Cut Sheet	Max Plot Length With 120-Foot Roll
1042GT	ANSI A,B,C,D,E,F ISO A4,A3,A2,A1,A0	50 in/1270 mm
1043GT	ANSI A,B,C,D,E,F ISO A4,A3,A2,A1,A0	NA
1044GT	ANSI A,B,C,D,E,F ISO A4,A3,A2,A1,A0	100 ft/30.5 m

Media

Size

Cut Sheet (maximum)
1043GT, 1042GT, 1044GT: 36.7 x 48 in/932 x 1245 mm

Roll (maximum)
1042GT, 1044GT: 36.7 in x roll length/932 mm x roll length (Plot limited to 48 in length)
1042GT, 1044GT with narrow media adapter option: 15.4 in x roll length/391 mm x roll length (Narrow media plot limited to 36 in length)

Plot Area

Cut Sheet

All models require a 0.8 in/20 mm border on all four edges on all sizes. Maximum width for all models is 34 in/914 mm.

Roll

Same border and width specifications as cut sheet. Maximum plot length for 1042GT is 50 in/1270 mm. Maximum plot length for 1044GT is 100 feet.

Type of Media

Translucent	22-Pound Bond
100 Percent Rag	Gloss
Vellum E	Vellum 1411
Polyester Film (3 mil, single matte)	ClearPlot® Film

Pens

Number in Turret: 8

Types:

Liquid Ball	Liquid Ink, disposable
Plastic Tip	Liquid Ink, refillable
Fiber Tip	

CalComp media and pens are recommended for best results.

Performance Specifications

Resolution	0.0005 in/0.0125 mm
Repeatability	0.005 in/0.127 mm
Accuracy	0.1 percent of the move up to 45 in/ 1143 mm, or 0.254 mm/0.010 in, whichever is greater
Acceleration	1.2 g
Speed	24 ips/610 mmps

Standard Features

RS-232-C Interface
Plot Manager Firmware
CalComp PCI and 960 (or CPGL) Data Format
2K Input Buffer
22K Plot Management Buffer
Terminal RS-232-C Input/Output Port
Nonvolatile Setup Memory for four configurations (users)
Joystick
Power Cord
Sample Pen Kit

Standard Drums

1042GT:	36 in/914 mm removable; with grit bands
1043GT:	36 in/914 mm removable; with grit bands
1044GT:	36 in/914 mm removable; with grit bands plus
	36 in/914 mm removable; with sprocket pins

Options and Accessories

IEEE 488 Parallel Interface
RS-449 Long-Line Interface
Narrow Media Adapter Kit (1042GT/1044GT) for 15.4-inch wide rolls
Additional Grit Drums (22,23.4,24,28,30,33.1,34,36 inches)
Additional Pen Turrets
Reticle (for precise manual pen positioning)
Premium Pen Kit (start-up supply of pens, ink, reticle and cleaning accessories for check plotting and final plotting)
HCBS Host Computer Basic Software

USING THIS USER'S GUIDE

This User's Guide has been arranged in such a way as to teach you the fundamentals of plotting, starting from the moment you unpack your new unit. This should allow you to get your unit running within the first hour.

The first three chapters familiarize you with various simple operations, such as loading media into the machine, selecting and using plotter pens, and loading and operating the pen turret.

These introductory chapters are followed in turn by more advanced exercises that teach you how to employ the many special features found on these plotters and how to carry out routine maintenance procedures on the unit.

If you use this User's Guide as a tutorial, start from the beginning and follow it all the way through. If you've already used one of the CalComp 1040GT plotters, then you may want to turn to a particular section or topic for more specific information. For aid in solving a problem, turn to the chapter on Troubleshooting. Here you'll find a quick reference chart of situations you might encounter and suggestions on how to solve them.

To find specific topics of interest, use the Table of Contents on the following page or the Index at the back of this User's Guide.

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CHAPTER ONE
GETTING STARTED

UNPACKING INSTRUCTIONS

Each plotter comes fully assembled and packed in one carton. Follow these instructions for unpacking:

1. Remove the shipping box carefully.
2. Remove all packing materials, including any plastic covering the plotter.
3. Check the contents of the box. The contents should include:
   - Plotter Unit
   - Pen Turret
   - Sample Pen Kit
   - ROMPACK Cartridge
   - Power Cable
   - User's Guide
   - Brush, Grit Cleaning
   - Spare Fuses
   - Paper Cutter
   - Media Core (not with 1043GT)
   - Cut Sheet Bond Media for 1043GT
   - Roll Translucent for 1042GT and 1044GT
   - Grit Drum
   - Sprocketed Drum (1044GT only)
   - Main Fuse Holder and Fuse
   - 10 ft/3m RS-232-C Interface Cable

NOTE

If you have ordered additional or optional equipment, make sure these items are included in the shipment (for example, premium pen kit, narrow paper adapter kit or CPGL).

4. Install the plotter in a room with sufficient ventilation. Make sure this room is within the temperature and humidity standards for proper operation of the plotter. (See Environmental Requirements.) Also, pull the plotter away from any wall or object to ensure that you have easy access to the back of the plotter.

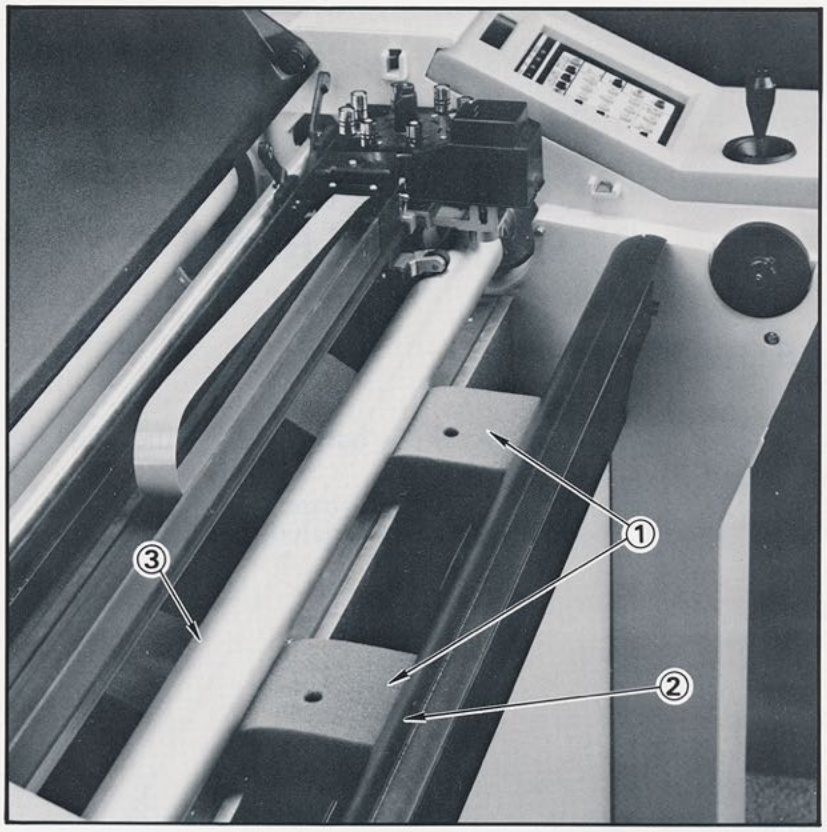
   The 1040GT plotter contains photosensitive sensor devices that may be adversely affected by excessive ambient light, such as direct sun or high intensity floodlights. Do not place the plotter where it is exposed to such lighting conditions.

   Once you have placed the plotter where you want it, fix and lock the casters so it does not move around.

NOTE

Throughout this User's Guide, positions such as left and right refer to directions as they are perceived by the operator facing the front of the plotter.

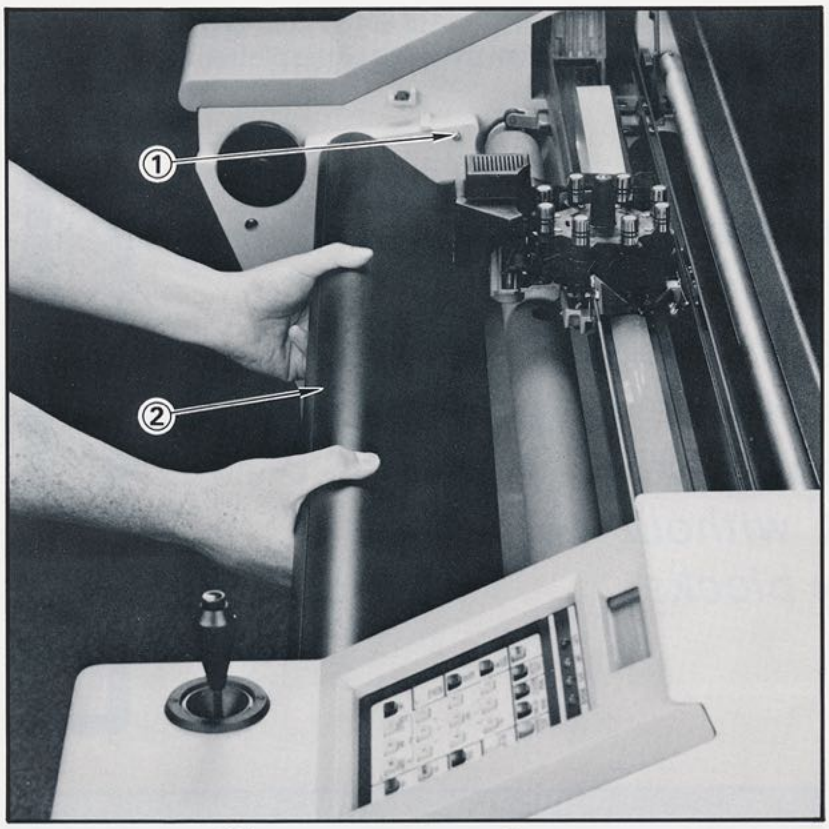
5. The platens, shown below in Figure 1-1, are curved pieces of metal at the front and rear of the drum. Lock the two platens into place as shown in Figure 1-2.



① *Packing Material* ② *Platen* ③ *Drum*

Figure 1-1. Platens in Shipping Position

The platens have a curved guide slot that allows you to maneuver them backwards and up so that they can clear the dowel pins. Slide the platen's forward edge over the dowel pins. Push gently until the platen locks in place.



① *Platen Dowel Pin* ② *Platen*

Figure 1-2. Platen Positioning

NOTE

On the 1042GT, it is easier to preposition the rear platen (prior to positioning the front platen) by reaching beneath the drum from in front of the plotter, and moving it up onto the pins before going around to the back and locking the platen in place.

6. Raise the pinch roller lever to the UP position. Move the left pinch roller to the left side. (On the 1044GT model, make sure the pinch roller does not touch the teeth of the sprocket drum.)

7. Position the pen carriage towards the center of the plotter.

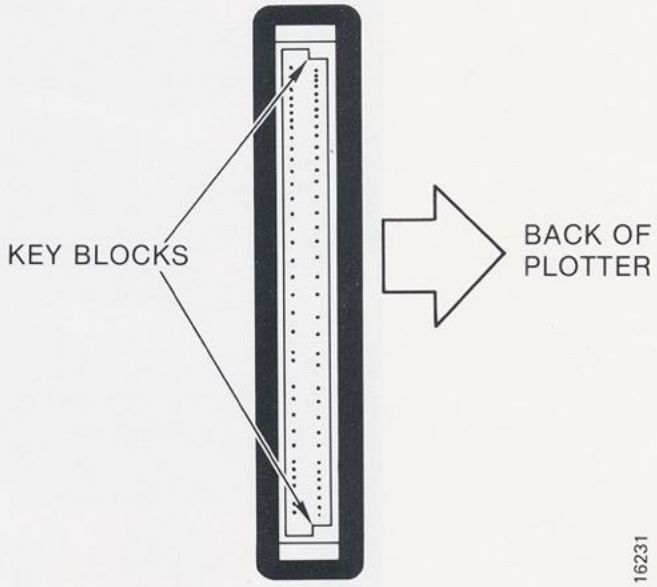
8. Make sure the power switch, located just below the control panel, is off. Determine the power requirements you need for the plotter. Locate the Voltage Selector Switch and select the switch position that matches the voltage of your outlet. Install the line fuse and fuse cap into main fuse holder using the fuse included with the fuse cap. Plug the power cable into an appropriate electrical socket. For electrical requirements, please refer to the Power Requirements list.

9. Connect the power plug to the plotter. The power plug receptacle is located at the bottom rear interface panel of the plotter, just below the main fuse.

10. Insert the ROMPACK into the slot on the outside of the right pedestal. (See Figure 1-3.) The small key blocks on the ROMPACK pin housing face the back of the plotter. See ROMPACK installation on page 2-22 for complete instructions.

CAUTION

Damage to the connector pins will result if you attempt to install the ROMPACK without aligning the key blocks.



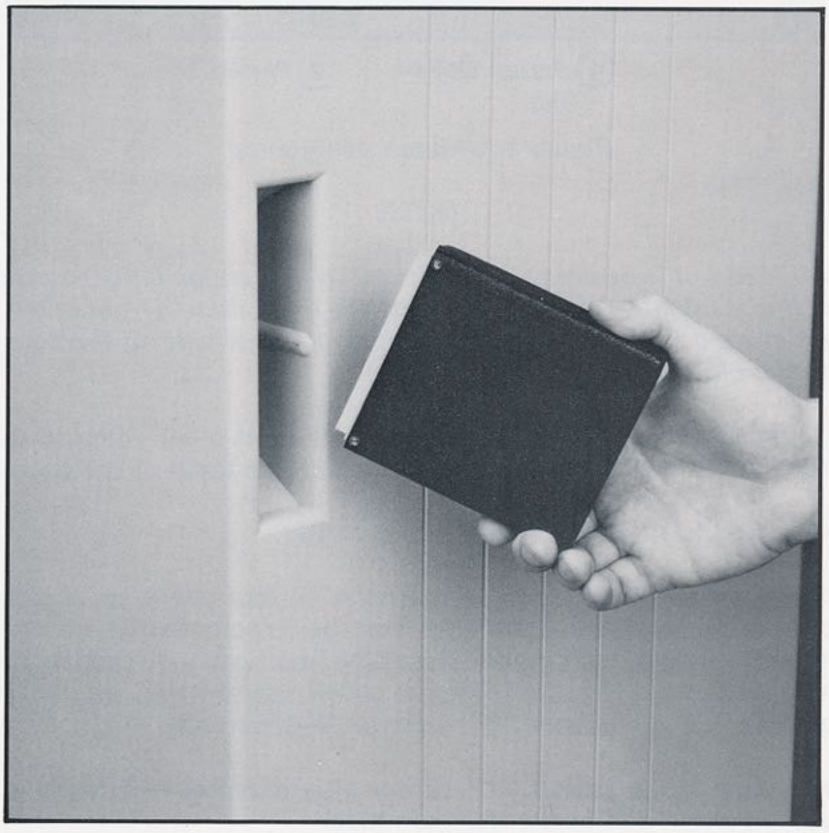


Figure 1-3. ROMPACK Installation

If you've followed these instructions, the plotter should be ready for use.

On this page is a diagram of a 1040GT Series plotter with the names and locations of basic parts making up the unit (Figure 1-4). Familiarize yourself with the nomenclature. These are used repeatedly in this User's Guide.

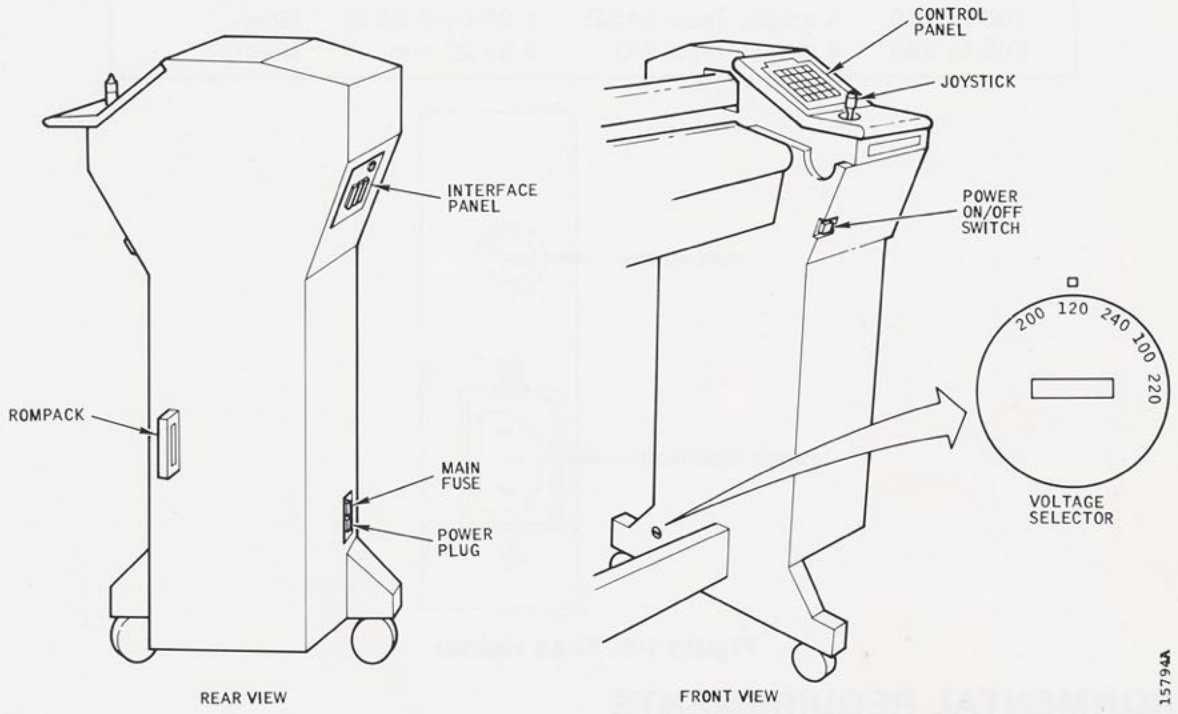


Figure 1-4. Location of 1040GT Basic Parts

Replacing a Fuse

Follow steps 1 through 5 for replacing a fuse.

1. Set the Power switch to the 0 position, and unplug the power cord.
2. If a fuse holder is installed as shown in Figure 1-5, remove it as follows. Place a screwdriver in the holder slot, press it in slightly, and turn it counterclockwise until the holder pops out.
3. If a fuse is in the holder, remove it.
4. Insert a new fuse into the holder. Check Table 1-1 for the correct size and value.
5. Install the fuse holder as follows. Put the holder in its place. Place a screwdriver in the holder slot, press it in slightly, and turn it clockwise until the fuse holder is fully seated.

TABLE 1-1. SELECTING A FUSE

VOLTAGE	FUSE RATING	SIZE	FUSE CAP
100 to 120	5 amps, Type 5ASB	1.25 by 0.25 in	Grey
200 to 240	4 amps, Type 4AT	5 by 20 mm	Black

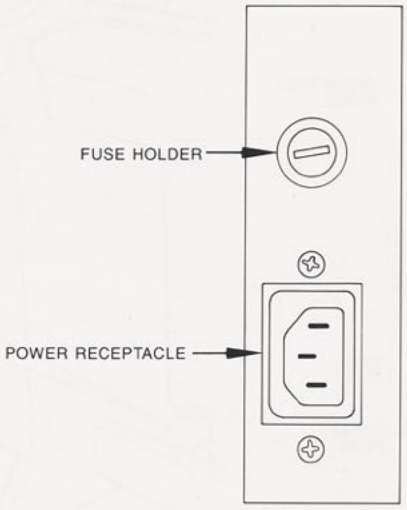


Figure 1-5. Fuse Holder

ENVIRONMENTAL REQUIREMENTS

Listed below are the electrical and environmental requirements.

Power

Standard

90 to 110 VAC, 47 to 63 Hz, 2.0 amp
108 to 132 VAC, 47 to 63 Hz, 1.7 amp
198 to 242 VAC, 47 to 63 Hz, 1.0 amp
216 to 264 VAC, 47 to 63 Hz, 1.0 amp

Power Dissipation

250 peak watt
200 average watt
700 BTU/175 Kg-cal per hour

CAUTION

Before switching on your plotter, ensure it is adapted to the voltage of the ac power source. You must select the correct voltage on the voltage selector switch. Failure to set the ac power input of the plotter for the correct voltage level causes damage to the unit when plugged in.

Environment

Temperature	
Storage	-29 to 70 degrees Celsius -20 to 158 degrees Fahrenheit
Operating	15 to 35 degrees Celsius 59 to 95 degrees Fahrenheit
Relative Humidity	40 to 60 percent noncondensing
Altitude	
- 60 to 4,200 m - 200 to 14,000 ft	Models 1043GT, 1044GT in cut sheet mode Model 1042GT in cut sheet and roll modes
- 60 to 2,400 m - 200 to 8,000 ft	Model 1044GT in roll mode

NOTE

Like most electronic equipment, the plotter requires a controlled environment. Never exceed the limits of humidity, temperature or altitude. Install the plotter in a well-ventilated room.

RUNNING THE DEMO PLOT

Now that the unit is unpacked and plugged in, you can test the plotter.

The demo plot can be run off-line. That means using the plotter without a computer. (Connecting the plotter to the computer is covered in Chapter Two.)

Before running the demo plot, it is necessary to install the pens in the turret and load the media onto the plotter. The following procedures provide the necessary instructions for a successful demo plot run:

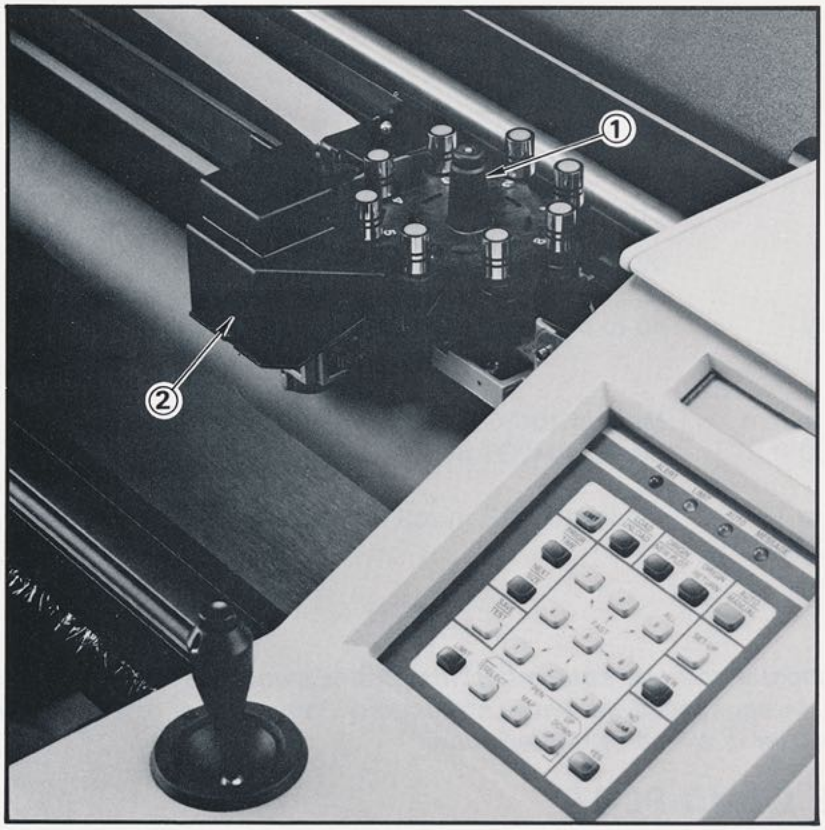
- Pen Turret Installation
- Loading Cut Sheet Media (1043GT or 1042GT/1044GT)
- Loading Roll Media (1042GT or 1044GT)
- Running the Demo Plot

Pen Turret Installation

An illustration of the turret and pen carriage assembly is shown in Figure 1-6.

1. Make sure the pen caps on the turret are beige in color. The beige caps are designed for use with fiber, plastic and roller ball pens and are already installed on the turret when you receive it. (Black pen caps are used for liquid ink pens only.)

   If you need to install a pen cap, take one between your thumb and forefinger, squeeze the cap and slide it into the opening of the pen cap holder, making sure that the cap holder brackets fit snugly into the cap's groove.



① *Turret* ② *Pen Carriage Assembly*

Figure 1-6. Turret

NOTE

Spare beige caps are supplied with the premium pen kit only. Black liquid ink caps are supplied with both the premium pen kit and the sample pen kit that is supplied with your plotter.

2. Select a pen from your sample pen kit and remove the protective pen cover. Don't use liquid ink pens for this demonstration; use only pens with stripes around the top.

3. Carefully insert the pen, point down, into the turret at pen position number one as shown in Figure 1-7.

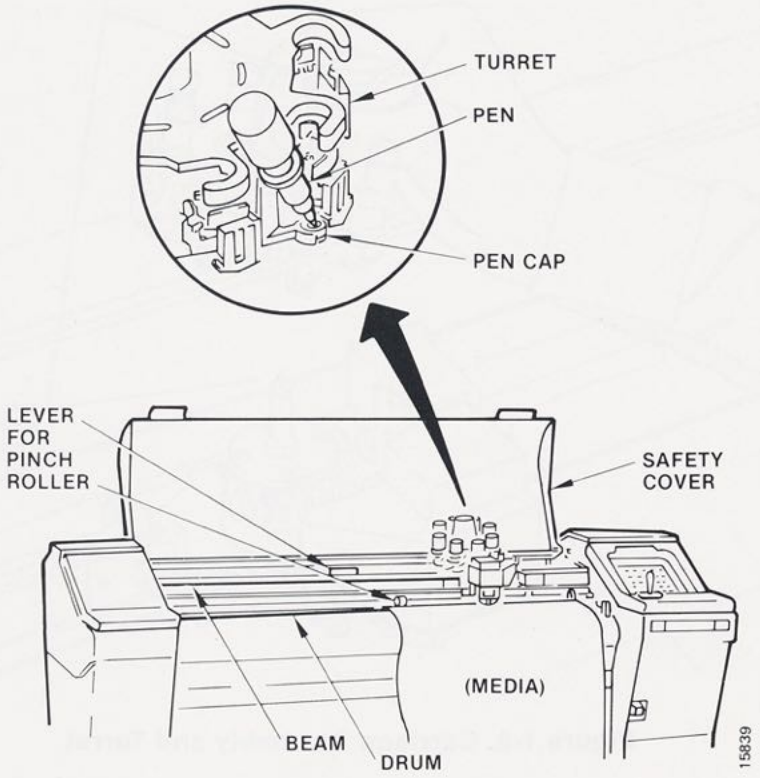


Figure 1-7. Pen Insertion

The easiest way to insert the pen, is to place the plotter pen point in the pen one cap at turret position number one and then rotate the pen body into the holder.

Follow this same procedure for the other seven pens. At this time, it doesn't matter which colors you use.

4. When fully loaded with pens, install the turret on the carriage assembly as shown in Figure 1-8.

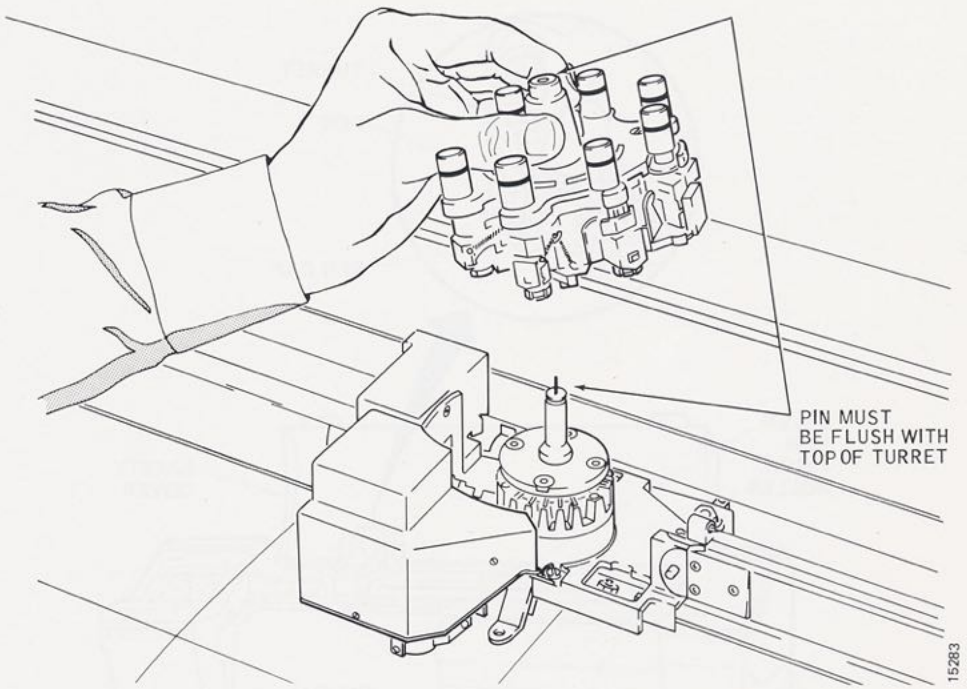


Figure 1-8. Carriage Assembly and Turret

Grasp the pen turret with your thumb and forefinger by the center post and adjust the turret on the carriage until the center post is flush with the top of the turret. This may require you to rotate the turret right or left slightly until it seats properly. Press down gently on the turret if the post isn't perfectly flush with the top of the turret when the turret is seated.

NOTE

If the power is off, it is necessary to physically lower the penholder in order for the turret to rotate freely.

5. Lower the safety cover and turn the power switch to ON. The power switch is below the operator's control panel on the right pedestal.

   The plotter displays the CalComp copyright information momentarily followed by this message:

   Display:

   Turret Init
   Please Stand By

   This display indicates that the turret is initializing and the plotter is familiarizing itself with the position of the pens. When this process is completed the display reads:

   Display:

   Position Carriage &
   Load Paper Please

   (Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

You've completed the installation procedure for the pen turret. Now it's time to load the media. Since each of these plotters has a distinctive method for loading media, the instructions are divided into four sections. The first section deals with the installation of cut sheet media on the 1043GT, the second deals with loading cut sheet on the 1042GT and 1044GT. The third section describes loading roll media on the 1042GT, and the fourth deals with loading roll media on the 1044GT. Use the instructions that apply to your plotter.

Loading Cut Sheet Media (1043GT)

1. Raise the safety cover. Release the pinch roller locking levers.

   Display:

   Please Lower Cover
   Please Load Paper

2. While facing the front of the plotter, place the front edge of the media sheet on the platen.

3. Slide the media under the pinch rollers and beam, as shown in Figure 1-9, until its length is evenly divided (front and back) on the drum.

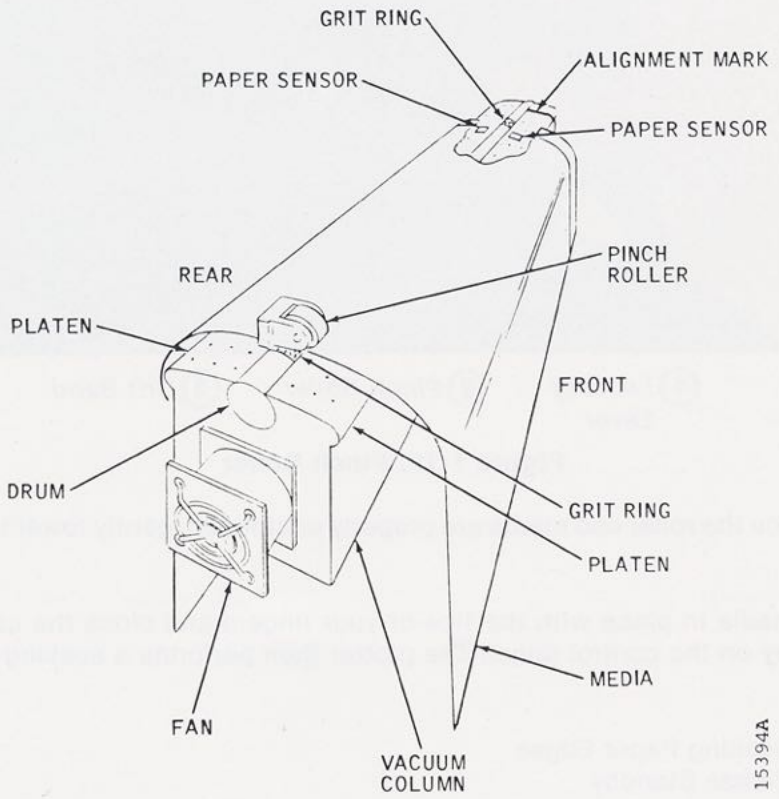
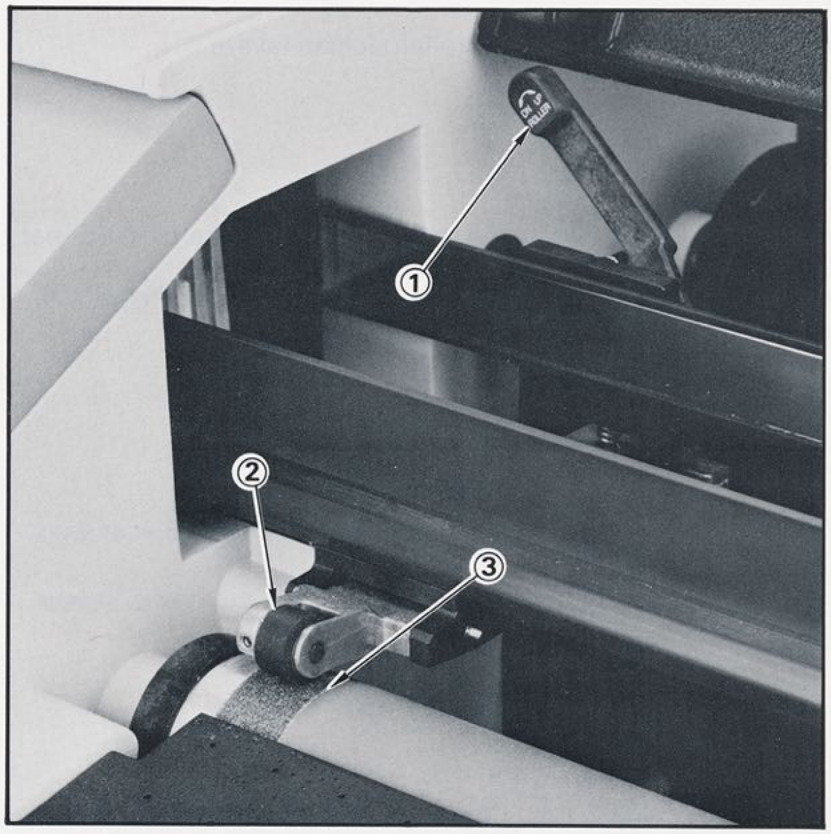


Figure 1-9. Media Loading (Cut Sheet)

4. Align the right edge of the media with the alignment mark on the right edge of the platen. Aligning the media as close as possible to parallel with the alignment mark prevents or at least minimizes paper skewing. The right grit ring should always be under the right media edge.

5. While the right pinch roller always remains stationary, you may need to move the left pinch roller to the left edge of the media. To do this, release the lever at the rear of the roller mechanism (see Figure 1-10) and slide the pinch roller until its left most edge rests on the left edge of the media.



① *Locking Lever* ② *Pinch Roller* ③ *Grit Band*

Figure 1-10. Pinch Roller

On the 1043GT, once the roller and media are properly positioned, gently lower the levers into the lock position.

6. Lightly hold the media in place with the tips of your fingers and close the safety cover. Press the LOAD/UNLOAD key on the control panel. The plotter then performs a seeking media edge routine.

Display:

Seeking Paper Edges
Please Standby

7. At the end of a successful load.

   Display:

   Ready
   Press AUTO to Plot

Loading Cut Sheet Media (1042GT and 1044GT)

1. Raise the safety cover.

   Display:

   Please Lower Cover
   Please Load Paper

2. The plotter may already be preset to cut sheet media. However, you should check this selection before proceeding. This is done using the following procedure:

   First, press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for Menu

   Press 1, then 0, then ENTER keys.

   Display: (Depends on plotter model)

   Media? Cut = 0
   Roll-15 = 1, 36 = 2, Dis = 3

   (1042GT display shown; 1044GT is slightly different.)

4. If the media type is already set to 0 (Cut Sheet Mode), then press the AUTO key twice and return to the initial loading instructions. If, however, the value is set to something else, press 0, ENTER, SAVE, and ENTER keys, then the AUTO key twice. This should return you to the following:

   Display:

   Position Carriage &
   Load Paper Please

   (Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

5. While facing the front of the plotter (Figure 1-11), place the front edge of the media sheet on the platen.

6. Slide the media under the pinch rollers and the rail until its length is evenly divided between the back and front.

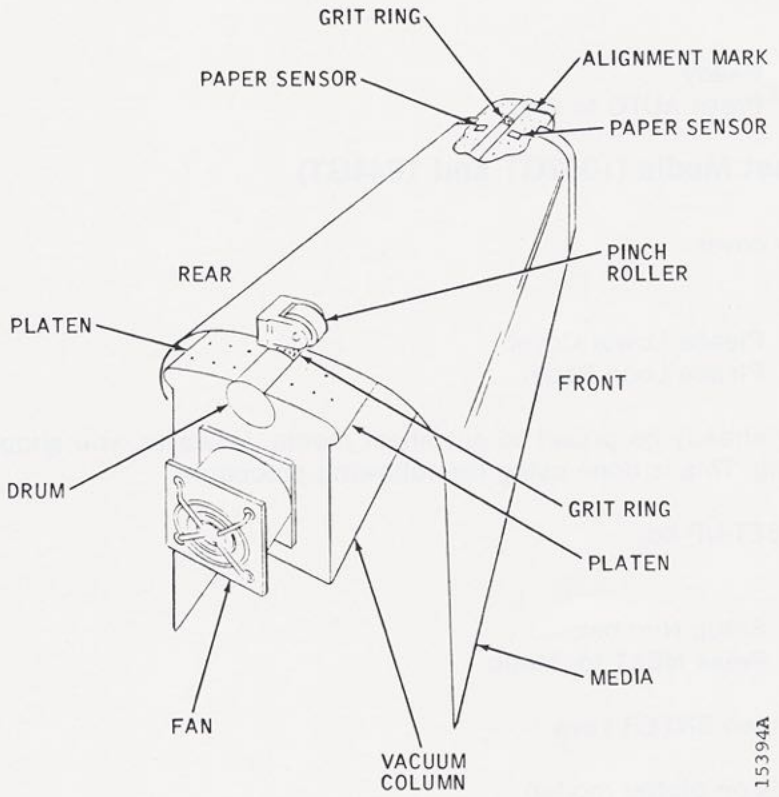
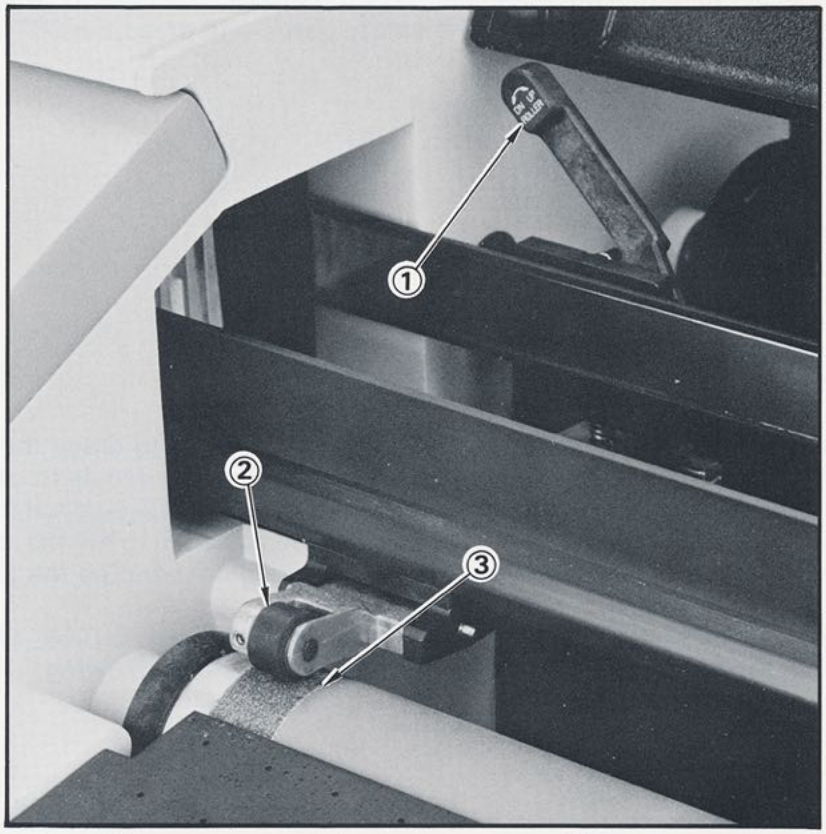


Figure 1-11. Media Loading

7. Align the right edge of the media with the alignment mark on the right edge of the platen. Aligning the media as close as possible to parallel with the alignment mark prevents or at least minimizes paper skewing. The right grit ring should always be under the right media edge.

8. While the right pinch roller always remains stationary, you may need to move the left pinch roller to the left edge of the media. To do this, release the lever at the rear of the roller mechanism (see Figure 1-12) and slide the pinch roller until its left most edge rests on the left edge of the media.



(1) Locking Lever *(2) Pinch Roller* *(3) Grit Band*

Figure 1-12. Pinch Roller

Once the roller and media are properly positioned, gently lower the lever into its locked position.

9. Lightly holding the media in place with the finger of your left hand, close the safety cover. Press the LOAD/UNLOAD key on the control panel. The pinch rollers lower to grip the media and hold it against the drum. Release your hold on the media.

   Display:

   Seeking Paper Edges
   Please Standby

10. At the end of a successful load.

    Display:

    Ready
    Press AUTO to Plot

Loading Roll Media (1042GT)

The 1042GT comes with a grit drum installed and uses unpunched roll media.

1. The 1042GT can be set for either cut sheet media or roll media. You have to define the selected media type. To do this, with the power on, raise the safety cover, and press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for Menu

2. Press 1, then 0, then ENTER keys.

   Display:

   Media? Cut = 0
   Roll-15 = 1, 36 = 2, Dis = 3

   The Dis (Display) feature allows you, when using roll feed media, to drape the media over the front edge of the platen instead of rolling it up on the take-up roll. If you decide to use this capability, you must select the display prompt to prevent the motor that drives the take-up roll from continuing to run. It is important to remember to return to roll selection when you want to roll the media onto the take-up roll. As long as you are in the Display Mode the motor does not wind up the take-up roll.

3. Press the key corresponding to the media type size being used. Press ENTER, SAVE and ENTER keys, then the AUTO/MANUAL key twice. This should return you to the following:

   Display:

   Position Carriage &
   Load Paper Please

   (Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

4. Unlock the casters and move the plotter to allow access to the rear of the plotter. Install the supply roll. (This is most easily done by moving to the back of the plotter.) Position the roll so that the media feeds from the top of the roll.

   The spool on the left side is spring mounted and can be pressed in, allowing the left end of the roll to be seated. Grasping the supply roll, position the left end on the spool at the left side. Match the notch on the left end of the roll to the key on the left spool (see Figure 1-13).

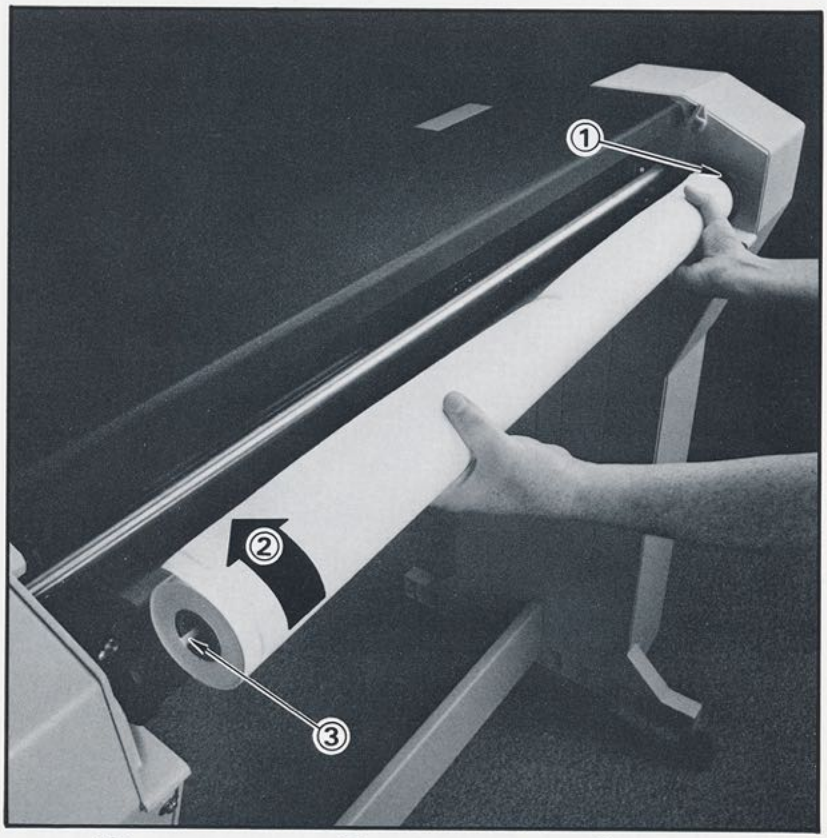
   Using the core, press in on the spring-mounted spool on the left end, and move the right-end notch into alignment with the right key on the right spool.

   Gently release your pressure until the supply roll is properly seated.

   Position the media hold-down bracket on the right end of the roll. This maintains tension on the supply roll as the media is being unrolled.

Gently release your pressure until the supply roll is properly seated.

Position the media hold-down bracket on the right end of the roll. This maintains tension on the supply roll as the media is being unrolled.



① *Adjustable Spool* ② *Paper Path* ③ *Key Slot*

Figure 1-13. Loading Supply Roll

5. Now move to the front of the plotter and install the take-up media core onto the front take-up spools as shown in Figure 1-14. The spool on the left side is spring mounted and can be pressed in, allowing the left end of the roll to be seated. Grasping the media core, position the left end onto the idle spool at the left side. Press to the left until the right end of the core is aligned with the right spool. The spool on the right side has a single key that, when matched to the notched end of the media core, holds the core secure. Release the core pressure to the left, and allow the right side of the core to seat into place.

① *Adjustable Spool* ② *Key Slot*

Figure 1-14. Loading Take-Up Core

6. Pull the media through from the back. Ensure that the media feeds from the top. Thread the media under the idler roller, over the back platen, across the drum, and under the pinch rollers, then over the front platen and under the take-up core as shown in Figure 1-15.

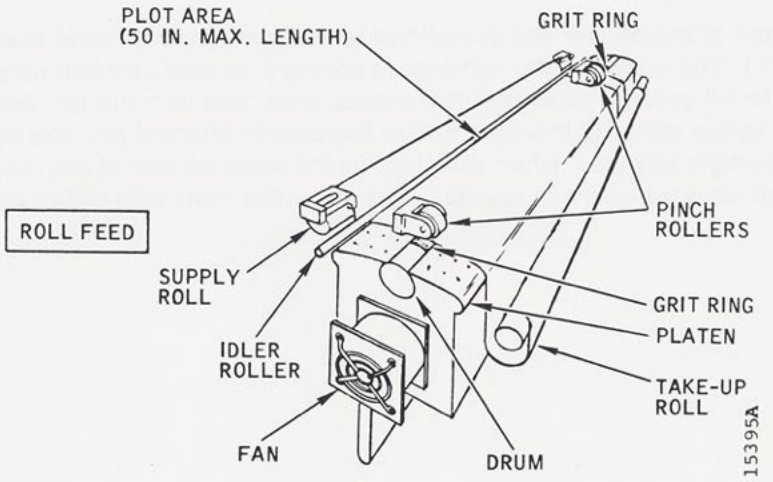


Figure 1-15. Roll Feed

7. Tape the cut edge of the roll to the take-up core using a small piece of tape. Ensure that the media is straight when you tape it. Then, manually rotate the take-up core two turns, taking up the media slack and applying an even tension across the width.

   The front and rear left take-up spools are adjustable to compensate for slight variations in media widths and inner core lengths. These spools are adjusted so that the face of the spools almost touch the edge of the paper. If the left spool is adjusted too tightly, it causes the media to bunch up on the edge. If the left spool is adjusted too loosely, it allows the media to weave when it is being rolled up. To adjust either front or rear spools, hold onto the media core or roll with one hand and rotate the flange of the spool with the other hand.

8. Close the safety cover. Press the LOAD/UNLOAD key on the control panel. The pinch rollers lower to grip the media and hold it against the drum. This message appears:

   Display:

   Seeking Paper Edges
   Please Standby

9. At the end of a successful load, the following message appears:

   Display:

   Ready
   Press AUTO to Plot

Loading Roll Media (1044GT)

The 1044GT comes with a sprocketed drum installed and uses punched roll media in this configuration.

1. Because the 1044GT can also be set for cut sheet media, you have to define the selected media type. To do this, with the power on, raise the safety cover, and press the SET-UP key. This message appears:

   Display:

   Setup Number:
   Press NEXT for Menu

2. Press 1, then 0, then ENTER keys.

   Display:

   Media? Cut = 0
   Roll-15 = 1, 36 = 2,

3. Press 2 (for 36-inch-wide roll), or press 1 (for a 15-inch-wide roll), ENTER SAVE, ENTER keys, then the AUTO/MANUAL key twice. This should return you to the following:

   Display:

   Position Carriage &
   Load Paper Please

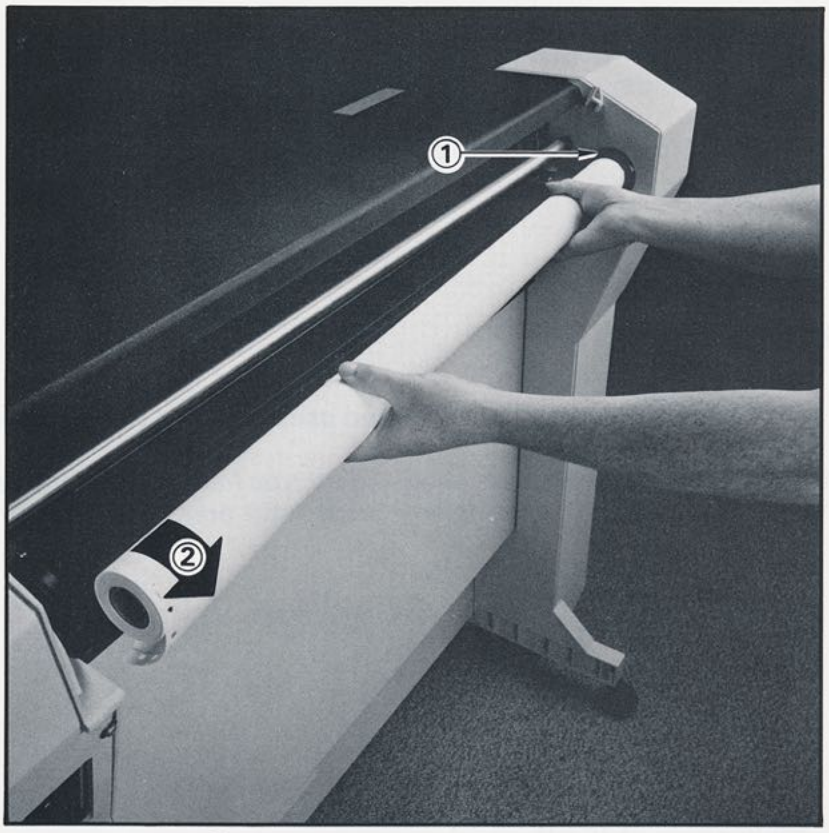
   (Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

4. Unlock the casters and move the plotter to allow access to the rear of the plotter. Install the supply roll. (This is most easily done by moving to the back of the plotter.) Position the roll so that the media feeds from the bottom of the roll (see Figure 1-16).

   The spool on the left side is spring mounted and can be pressed in, allowing the left end of the roll to be seated. Grasping the supply roll, position the left end on the spool at the left side. Match the notch on the left end of the roll to the key on the left spool.

   Using the core, press in on the spring-mounted spool on the left end, and move the right-end notch into alignment with the right key on the right spool.

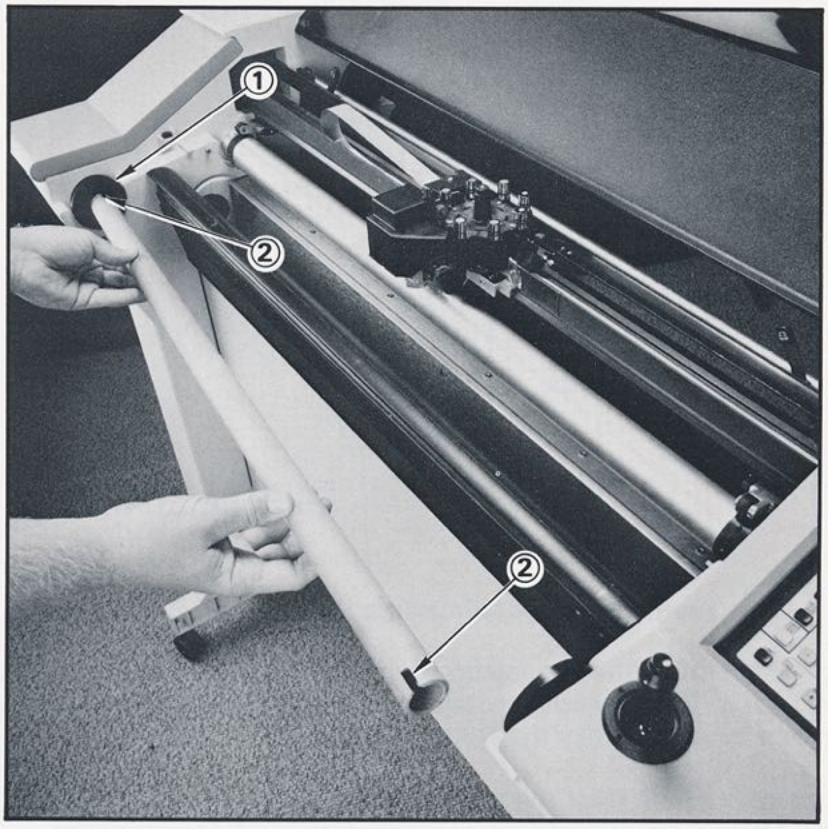
   Gently release your pressure until the supply roll is properly seated.



① *Adjustable Spool* ② *Paper Path*

Figure 1-16. Loading Supply Roll (1044GT)

5. Install the take-up media core onto the take-up spools (see Figure 1-17). The spool on the left side is spring mounted and can be pressed in, allowing the left end of the roll to be seated. Grasping the media core, position the left end onto the idle spool at the left side. Press in to the left until the right end of the core is aligned with the right spool. The spool on the right side has a single key that, when matched to the notched end of the media core, holds the core secure. Release the core pressure to the left, and allow the right side of the core to seat into place.



① *Adjustable Spool* ② *Key Slot*

Figure 1-17. Loading Take-Up Core (1044GT)

6. Unroll the media through from the back. Ensure that the media feeds from the bottom of the roll.

7. Draw the media across the rear vacuum cannister over the drum, and across the front vacuum cannister.

8. Pull about three feet of media up and forward, clear of the drum sprockets.

9. Thread the media down into the front cannister and under the take-up core.

Fit the media onto the sprocketed drum, ensuring the media's holes fit snugly onto the sprocket teeth and that the media is aligned properly as shown in Figure 1-18.

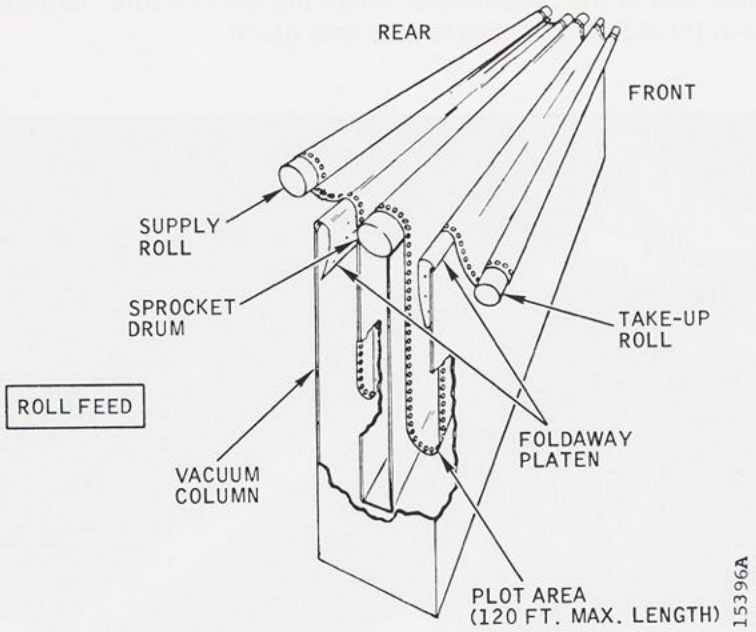


Figure 1-18. Loading on a Sprocketed Drum

10. Tape the cut edge of the roll to the take-up core using a small piece of tape. Ensure that the media is straight when you tape it. Then, manually rotate the take-up core two turns, taking up the media slack and applying an even tension across its width.

11. Manually unroll enough media from the feed roller so that it loops at least halfway down the rear vacuum cannister. Allow a similar amount of media into the front cannister.

    The front and rear left take-up spools are adjustable to compensate for slight variations in media widths and inner core lengths. These spools are adjusted so that the face of the spools almost touch the edge of the paper. If the left spool is adjusted too tightly, it causes the media to bunch up on the edge. If the left spool is adjusted too loosely, it allows the media to weave when it is being rolled up. To adjust either front or rear spools, hold onto the media core or roll with one hand and rotate the flange of the spool with the other hand.

12. Close the safety cover. Press the LOAD/UNLOAD key on the console. The vacuum inside the vacuum cannister automatically draws the media down into both the front and rear columns, holding the media taut against the drum surfaces.

13. When the plotter has cycled through its loading program, the message reads:

    Display:

    Ready
    Press AUTO to Plot

Running the Demo Plot

The demo plot is an internally contained plot program designed to demonstrate the axis drive and pen command functions of the plotter. A demo plot can be run independently of any computer input, and a sample of the demo plot is available before the computer is connected.

While the plotter is running, the time is displayed. The auto time is the time the plotter is actually in the Auto Mode. The plot time is the amount of time the plotter actually takes to draw the plot.

If you want to interrupt the plot without losing your place in the drawing, press the AUTO/MANUAL key. The plotter continues plotting until the memory buffer is empty and then the plotter stops.

If you wish to check the auto and plot times while the demo plot is being drawn, press the AUTO/MANUAL key followed by the PRIOR/TIME key and the time display reappears. Press the PRIOR/TIME key again and the total power-on time is displayed. Press the PRIOR/TIME key again and the display returns to a read out of the auto and plot times. From either display, you can press the AUTO/MANUAL key and the display returns to the original message. Press the AUTO/MANUAL key once again, and the plotting resumes right where it left off.

Notice the way the plotter uses straight pen strokes. Each stroke is the result of a vector command. Even circles and arcs are composed of numerous straight lines.

When the plotter draws a line, the penholder removes a pen from the turret and holds it in place just above the paper. The pen is then lowered onto the media surface and the plot begins.

Electronic circuits in the plotter decode all commands and convert them into electrical signals activating the appropriate plotter systems. When the pen carriage moves and the pen is down, the plotter draws a horizontal line (Y-axis). When the pen carriage is stationary and the plotting media moves while the pen is down, the plotter draws a vertical line (X-axis). When both the carriage and media move simultaneously, the plotter draws a diagonal line. Circles and other angles are governed by the velocity of the drum and carriage motors.

The plotter automatically sets all pen force, acceleration and velocity as each pen is taken from the turret. Sensors in the carriage read the pen by interpreting the absence or number of reflective bands on the pen body.

After loading the pen turret and media, use the following steps:

To access the Test Routine

1. Press the TEST key.

   Display:

   Routine Number:
   Press NEXT for Menu

2. Select the Demo Plot Test 0.

   - You may scroll to the test by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Routine Number:
   0 Demo Plot

   - - - - - - - - - - OR - - - - - - - - - -

   - You may directly select the Demo Plot Test 0 by pressing the 0 keyboard numeric key

3. After selecting either of the two methods, press the ENTER key and the message displays the prompt:

   Display:

   Demo Plot
   Press AUTO to Plot

4. Press the ENTER key and the demo plot is ready to commence plotting.

5. Press the AUTO key and the demo plot commences plotting. While the demo plot is running, the display reads:

   Display:

   Auto Time:
   Plot Time:
   (Value displayed is actual time)

   When the demo plot is completed the display reads:

   Display:

   Demo Plot
   Is Finished

   Once the plot is completed, it looks like the example in Figure 1-19.

To Remove Plot and Restore to Ready

1. Press the LOAD/UNLOAD key.
2. Raise the safety cover.
3. Remove the plot and the display reads:

   Display:

   Please Lower Cover
   Please Load Paper

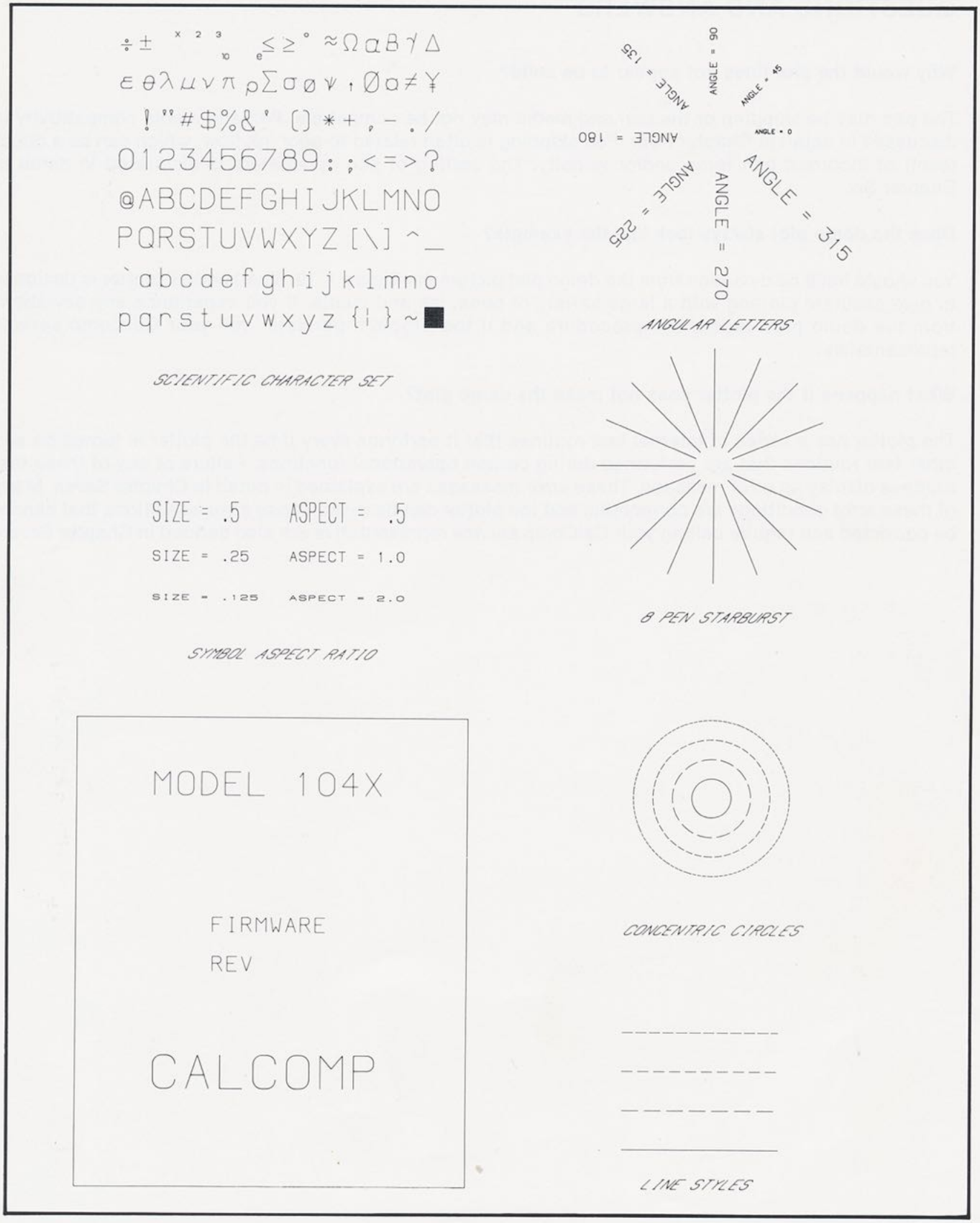

÷ ± × ² ³ ≤ ≥ ° ≈ Ω α β γ Δ
ε θ λ μ ν π ρ Σ σ ø ψ Ø α ≠ ¥
! " # $ % & ' ( ) * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~
SCIENTIFIC CHARACTER SET
ANGLE = 90
ANGLE = 135
ANGLE = 45
ANGLE = 180
ANGLE = 0
ANGLE = 225
ANGLE = 270
ANGLE = 315
ANGULAR LETTERS
SIZE = .5 ASPECT = .5
SIZE = .25 ASPECT = 1.0
SIZE = .125 ASPECT = 2.0
SYMBOL ASPECT RATIO
8 PEN STARBURST
MODEL 104X
FIRMWARE
REV
CALCOMP
CONCENTRIC CIRCLES
LINE STYLES

Figure 1-19. Demo Plot

QUESTIONS AND ANSWERS

Why would the plot lines not appear to be solid?

The pen may be skipping or the pen and media may not be compatible. Pen and media compatibility is discussed in detail in Chapter Four. Pen skipping is often related to poor ink flow, which can be a direct result of incorrect pen force and/or velocity. The setting of pen parameters is discussed in detail in Chapter Six.

Does the demo plot always look like the example?

You should have no deviation from the demo plot pictured in Figure 1-19. The 1040GT plotter is designed to give accurate plotting with a large variety of pens, ink and media. If you experience any deviations from the demo plot, repeat the procedure and if the problem persists, call your CalComp service representative.

What happens if the plotter does not make the demo plot?

The plotter has a series of internal test routines that it performs every time the plotter is turned on and other test routines that are performed during certain operational functions. Failure of any of these test routines display an error message. These error messages are explained in detail in Chapter Seven. Many of these error conditions are correctable and the plotter can be reset. Those error conditions that cannot be corrected and require calling your CalComp service representative are also defined in Chapter Seven.

OPERATOR CONTROLS AND INDICATORS

Introduction

All of the controls and indicators found on the 1040GT Series plotters are located on or near the front panel. There are five basic components as shown in Figure 1-20:

- Power Switch
- Message Display
- Status Indicators
- Keyboard
- Joystick

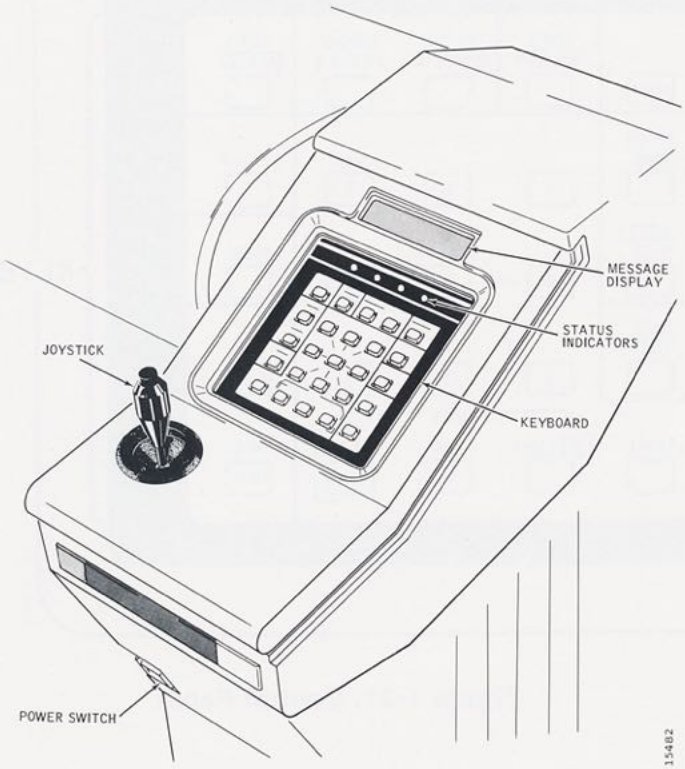


Figure 1-20. Front Panel, Right Side

Power Switch

The rocker power switch is located on the front right pedestal of the plotter.

By turning the power switch on, the plotter performs these initialization functions:

- Power-on Sequence
- Automatic RESET
- Power-on Diagnostics

When you turn the power switch off, the plotter lifts the pinch rollers and shuts down communication between the plotter and the computer. If you turn the plotter off while it is in the Unload Mode, the plotter positions the pen carriage 3 inches to the left of the right pinch roller assembly.

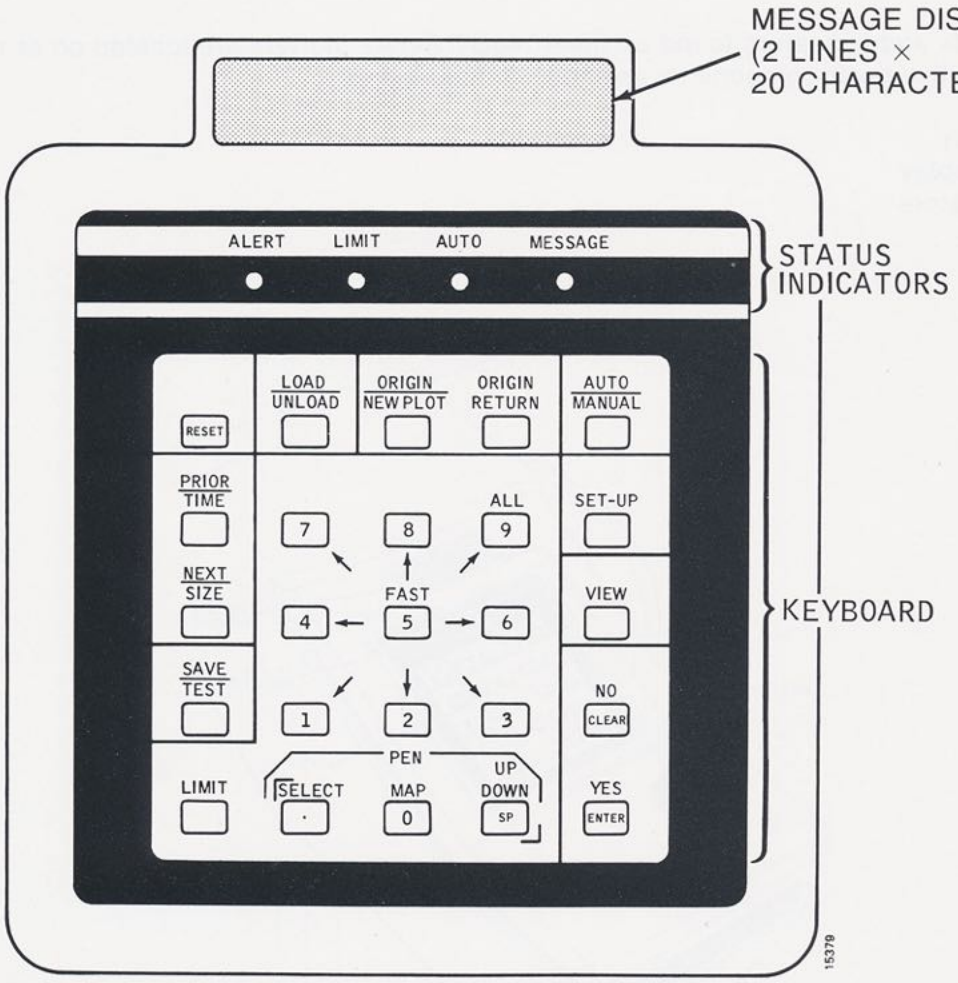


Figure 1-21. Control Panel

Message Display

This is an easy-to-read, 2-line, 40-character Liquid Crystal Display (LCD) that gives instructions or information as shown in Figure 1-21. In most cases, the complete message fits on two lines, but when the message is longer, the MESSAGE status indicator light remains on until all of the message has appeared on the display.

As you enter commands from the keyboard during Manual Mode operation, the message display guides you step by step to the next required action until a particular sequence is completed. The message display also alerts you to system errors, if they occur, and suggests solutions. While using the control panel keyboard it is very important that you watch the message display for these operator prompts.

Status Indicators

There are four status indicators on the upper portion of the control panel just below the message display. These are as follows:

- MESSAGE
- LIMIT
- ALERT
- AUTO

MESSAGE

This LED comes on and remains on whenever the message is larger than can be displayed in two lines on the screen. When this happens, press the NEXT key to get to the next screen until the message is completed. After the complete message has been displayed, press the RESET key and the light turns off.

An illuminated MESSAGE LED also indicates that various set-up, test, or host communications functions may be viewed by pressing the NEXT or PRIOR keys.

LIMIT

This LED comes on whenever the commands to the plotter have exceeded the physical or window limits of the plotter and reminds you that a piece of the plot is missing. Usually, this means you should change or adjust the plot scale. (The SIZE key is used to show the range of data lost and helps in determining the scaling or origin position to avoid the out-of-limit condition.)

ALERT

This indicator is on whenever a fatal error condition occurs, such as a crash. At the same time, the message display explains the nature of the error or gives an error code. (See Chapter Seven, Run-Time Diagnostic Messages table.)

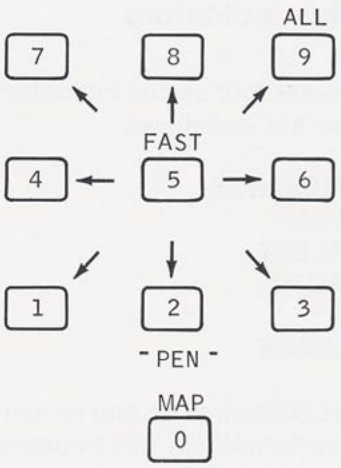
AUTO

This indicator remains on whenever the plotter is on-line and ready to receive plotting data or is plotting. When lit, all key functions on the control panel except the AUTO/MANUAL key are inhibited.

Keyboard

The plotter keyboard contains 25 keys, however, many of these keys perform more than one function. If this is the case, menus appear on the display screen presenting the possible choices you have.

NUMERIC (0-9)



These multifunction keys are used to type in various numbers as well as directional moves. Any of the directional moves can be accessed by pressing the appropriate key, and speeded up by pressing FAST (5) at the same time. When entering pen parameters universal to all pens, press the ALL (9) key. When using the Pen Mapping function, use the PEN MAP (0) key. See Chapter Six for more on this subject.

AUTO/MANUAL

Pressing this key puts you on-line (Auto) or off-line (Manual). When in Auto Mode, the plotter is ready to receive data from the computer; all keys on the control panel are inhibited except for this one. This key may be used at any point while plotting without risk of losing plot data. In Manual Mode, the plotter is off-line and all controls are usable.

ORIGIN RETURN

By pressing this key, you instruct the plotter to return to the point of origin of the current plot.

ORIGIN/NEW PLOT

Pressing this key causes the display to read: New Plot Yes or No? If the YES/ENTER key is pressed, a new plot origin at the current pen position is established. The New Plot function resets both plot time and plot size to zero, turns off the LIMIT indicator, and clears the buffer. If the NO/CLEAR key is pressed, the original plot origin is retained. If the Plot Management function is on (Set-Up 16), this function cannot be used until the plot in progress is completed.

LOAD/UNLOAD

This key loads or unloads the plotting media. If the media is unloaded, use the LOAD/UNLOAD key to load cut sheet or roll media. Pressing this key when media is loaded, releases the media for easy removal. If pressed prior to a plot completion, while in the Plot Management Mode, the plotter is reset to its initial parameters and the message: "Plot data will be lost/ plotter reset", is displayed for a short time.

RESET

This key should be used with caution. Pressing this key causes you to lose unsaved parameter values. This key also causes the media to unload. It also resets the plot timer, plot size and clears the LIMIT and MESSAGE indicators on the control panel. Pressing RESET in the PCI Mode (selected through host communications parameters) causes a check of the input buffers for good or bad data with the option of flushing all buffer data. Pressing RESET with a pen in the penholder causes that pen to drop onto the drum surface. This should be avoided, and can be, by removing pen from the penholder prior to pressing RESET.

PRIOR/TIME

By using this key when the MESSAGE LED is lit, you can scroll backward through set-up, test, or host communications functions. When the MESSAGE indicator is off, you may also use this key to display plot time, plotter power-on time, and Auto Mode time segments.

NEXT/SIZE

When the MESSAGE indicator is on, you can use this key to scroll forward through set-up, test, or host communications functions. When the MESSAGE indicator is off, you can use this key to display current plot size.

SAVE/TEST

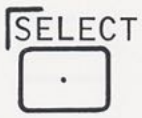
When using the set-up function, press this key to instruct the plotter to retain certain parameters changed from default values. After using the SAVE key, these new values are maintained even after power-down and can only be cleared by entering and saving new values. Up to four user configurations can be entered. When the display shows the READY message, pressing this key allows access to the Test function menu. For details, see Chapter Seven.

LIMIT

Use the LIMIT key to set upper left and lower right plot limits. The display prompts you to enter the limit parameters once the LIMIT key is pressed. The upper left limit is set by pressing the LIMIT key, followed by the DECIMAL (UPPER LIMIT) key, after manually placing the pen turret at the desired location. Set lower right limit after positioning pens at the selected position, then pressing LIMIT key followed by the SPACE (LOWER LIMIT) key. To reset the plotter to no-limit operation, press the LIMIT key followed by the CLEAR key.

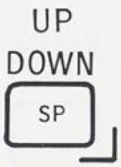
DECIMAL POINT /SELECT/UPPER LIMIT

Use the SELECT key to enter decimal values (.) for media compensation. This key also functions as a pen select key, choosing any pen from 1 through 8. Pressing this key, followed by the appropriate numeric key, causes the selected pen to move from its resting position in the turret to the plotting pen-up position. To return the pen to the turret, just press the SELECT key again followed by the 0 key. The SELECT key is also used in Set-Up 8 to move to the next message number. In addition, this key is used in conjunction with the LIMIT key to set upper left plot limits.



SPACE/PEN UP-DOWN/LOWER LIMIT

Use this key to advance the cursor on the message display while entering data directly to the plotter using the control panel keypad. Spaces in data entry here are usually interpreted as acceptance of default values. When the READY message appears, you may use the UP-DOWN key to manually move the selected pen up and down. This key is also used in conjunction with the LIMIT key to set lower right plot limits.



ENTER/YES

This key is usually used to give an affirmative answer to a question asked on the message display. Also use it to enter parameters and implement operator actions when the plotter is in the Manual Mode.

CLEAR/NO

This key is used to give a negative answer to a question asked on the message display. To remove an entered parameter and return to the default, or a previously saved value, use the CLEAR key.

VIEW

Use this key to position the drawing in progress for a clear view. After pressing the AUTO/MANUAL key (putting the plotter into the Manual Mode), press the VIEW key. The turret slides to the upper left limit of the plot and the media is positioned in such a way as to provide a clear view of the entire plotting surface. Press the AUTO/MANUAL key to continue plotting.

SET-UP

Use the SET-UP key to access a large number of functions including media selection, pen selection, host communications definition and plotter initialization. The 16 functions accessed are described in detail in Chapter Six.

Joystick

The joystick (see Figure 1-22) is functional in Manual Mode only. The joystick allows you to move the pen carriage (Y-axis) and drum (X-axis) manually to any position on the media. Directional movement of the joystick corresponds directly to the direction of the pen turret and media movement. However, if you move the turret beyond the plot limits (out of the plotting area), it automatically returns to the last plotting position as soon as the Auto Mode is entered.

There is a manual pen-up/pen-down push-button on top of the joystick. The pen tip remains on the plotting surface while the button is held down.

Figure 1-22. Joystick

CHAPTER TWO
CONNECTING THE PLOTTER

INTERFACING THE PLOTTER

Introduction

The only way in which a computer can relay information to the plotter is through a physical connection called an interface. Over the last decade several kinds of interfaces have become popular.

The 1040GT Series is able to support a number of these interfaces, including the RS-232-C (standard), RS-449 and the IEEE 488. Both the RS-449 and the IEEE 448 interfaces are optional.

TABLE 2-1. INTERFACE PROTOCOLS

Type	Mode
RS-232-C	Serial Asynchronous
RS-449	Serial Asynchronous
IEEE 488	Parallel

A single plotter can support only one kind of interface at a time. When the plotter is assembled at the factory, an interface panel is added to the rear of the plotter. This determines the protocol that the plotter accepts.

There are two basic steps involved in interfacing a 1040GT Series plotter:

- Setting host communications parameters on the plotter.
- Connecting the plotter to the host computer.

Before using the information in this section, read the communications section of your host Hardware Manual. This section tells you what your computer and your computer program are set up to accommodate. Such information as acceptable baud rates, parity bits and duplex modes are determined by your computer and the graphics software it is running.

Host Communications Parameters

DESCRIPTION OF HOST COMMUNICATIONS PARAMETERS

The Host Communications Parameters you need to enter via the control panel in Set-Up 7 are described in the following paragraphs. In most cases, this information must be supplied by someone who has specific information about the host computer and the graphics software being used. If the plotter is not set up to match the host, errors occur. If an error does occur, error messages on the control panel indicate which parameter is at fault. See the Run-Time Diagnostics Messages in Chapter Seven for error messages and solutions. The detailed description of the set-up procedures for the host parameters is located in Chapter Six.

Below are brief definitions of the parameters and how to use them.

Parity

Set parameter value to 0 if the host does not include a parity bit. Set to 1 if the host includes a parity bit to cause an odd number of 1 bits, and set to 2 if the host includes a parity bit to cause an even number of 1 bits.

Bits/Char

Set parameter value to 7 or 8, as required. All HOST COMPUTER BASIC SOFTWARE (HCBS) commands and data require 7 bits, while many modern computers use 8 bits per character. The plotter must match the computer or the plotter detects a framing error.

Stop Bits

Set parameter value to 1 or 2. Most computers format character messages with 1 stop bit. If the plotter requires 2 stop bits, it detects a framing error when the host sends characters with a single stop bit.

Clock

Set parameter value to 0 for internal clock or 1 for external clock. When data communications are asynchronous, the internal clock is always used.

Interface

Set parameter value to 0 (serial) or 1 (IEEE 488). Refer to the software manual for details.

Host Baud

The baud rate is the bit transmission rate. The baud rate at both ends of a serial asynchronous data communications link must be the same so that only one baud clock pulse occurs during a bit time.

The available host baud rates are standard rates from 110 to 19200. The most common baud rates are: 300 baud for acoustic coupler links, 1200 or 2400 baud for modems and 9600 for a cable of 50 feet or less.

Mode

Set parameter value to 0 for Plotter Communication Interface (PCI) Mode, or 1 for the 960 Mode. The correct choice is determined by the type of graphics software you are using. In 960 Mode, plot data is transmitted in 8-bit bytes directly convertible to analog signals that create the plot. PCI Mode must be translated to 960 Mode data by the plotter and then used to create the plot. The main advantage of PCI Mode is its portability; it can be run on either local or remote terminals. The 960 Mode, on the other hand, is not portable and can only be run locally.

Term Muting

Set parameter value to Y (don't send plot data to the terminal) or N (do send plot data to the terminal). Because some computers require local terminal logon, a video display terminal may be connected to the interface panel permitting the plotter operator to communicate with the host. Set-Up 8 and Set-Up 9 provide this logon capability, therefore a terminal is not required on the 1040GT Series plotters. The SYNC CODE and EOM characters frame the plot records in the PCI Mode, so they can be recognized by the plotter. These plot records are not retransmitted to the terminal when the terminal is muted; however, all other characters are.

Checksum

Set parameter value to Y (yes, the host is transmitting a checksum byte) or N (no, the host is not transmitting a checksum byte). A mistake in selection of the Y or N causes the plotter to detect a checksum error in every record received. Refer to your Software Application Manual for details.

Isochronous

This feature is not supported on current 1040GT plotters. Set value to NO.

NOTE

ACK/NAK, Direct Control, and XON/XOFF are data communication protocols. The plotter defaults to ACK/NAK when Direct Control and XON/XOFF are set to NO. Refer to your Software Application Manual to select the proper protocols.

Direct Control

Set parameter value to Y (yes, the host uses direct data protocol) or N (no, the host uses another data protocol). With direct control, the host may send data anytime the clear-to-send (CTS) signal is active. Refer to your Software Application Manual.

XON/XOFF

Set parameter value to Y (yes, the host uses XON/XOFF data protocol) or N (no, the host uses another protocol).

ACK/NAK

This protocol isn't displayed on the control panel. It is the default protocol and is used by the plotter when N is entered for both direct control and XON/XOFF. Refer to your Software Application Manual for specification.

SYNC Code and EOM (PCI Mode)

These codes are usually provided as part of the software documentation, however, if not, they are provided in Test 14, Input Monitor Dump (IMD). Test 14 asks for two entries: enter NO for both, then have the host send a plot. Stop the plotter after ten lines of code, since you should never need more than that to find these two codes. When you are calling the plot from a terminal attached to the plotter, do not put the plotter in AUTO until after your final entry at the terminal.

With Test 14 selected, the incoming plot data is dumped (plotted) in lines of paired hexadecimal characters.

The SYNC CODE (or SYNC CODES) may be identified because it is followed by 20(Hex) and almost always preceded by either 0D(Hex) or 0A(Hex), often by both. There are several common sync codes in use, all are software dependent, but they are not difficult to find. In non-IBM installations, 02(Hex) is most common. Large IBM computers usually use two sync codes of 25(Hex) and the IBM PC (and compatibles) use a pair of 16(Hex) sync codes. Expect to see dump sequences that look something like this:

(Hex)0D 0A 02 20	(most common)
(Hex)0D 0A 25 25 20	(large IBM)
(Hex)0D 0A 16 16 20	(IBM PC)

Once you have identified the SYNC CODE, look through the dump hexadecimal code for a hex character set equal to or less than 20(Hex). The most common EOM is OD(Hex) (Carriage Return). The EOM may not be greater than IF(Hex) because that would conflict with plot data. As a leader block cannot exceed 128 characters in length, excluding framing characters, the EOM character can usually be found within 4-1/2 lines of print.

Refer to your Software Application Manual for SYNC Code and EOM specifications.

NOTE

The SYNC CODE and EOM are dumped as hexadecimal codes. Enter them at the control panel as decimal codes. Be sure to convert them from hexadecimal to decimal.

SETTING HOST COMMUNICATIONS PARAMETERS

Before your computer can relay data to your plotter, both must be talking a common language. This language is indicated by both the software used to drive the plotter and also by certain parameters you must enter. You can specify this information and enter it into the plotter using this procedure. (Additional detail is available in Chapter Six, Set-Up 7.)

1. Gather information indicated on the following chart.

TABLE 2-2. HOST COMMUNICATIONS PARAMETERS

Menu Selection	Submenu	Response Value Ranges
(selected by PRIOR, NEXT or appropriate numeric keys, followed by ENTER)	(selected by appropriate response prompt)	(respond by pressing appropriate numeric key, YES or NO keys)
0 Parity & Bits/Char	Par:0 = NO, 1 = 0, 2 = E Bits/Char:7/8	Parity = 0, 1, 2 Bits/Char = 7/8
1 Stop Bits & Clock	Stop Bits:1/2 Clock:0 = Int 1 = Ext	Stop Bits = 1/2 Clock = 0/1
2 Interface	0 = Serial, 1 = IEEE488 IEEE488 Address:	Interface = 0/1 Listen Address = 0-30
3 Host Baud & Mode	Host Baud Rate: Mode:1 = 960, 0 = PCI	Host Baud Rate = 110 150 300 600 1200 2400 4800 9600 19200 Mode = 0/1
4 Muting & Checksum	Term Muting:Y/N? Cksum Enable:Y/N?	Terminal Muting = YES/NO Checksum Enable = YES/NO
5 Isochronous & EOM	Isochronous:Y/N? End of Mess Chr	Isochronous = YES/NO End-of-Message Character = 1-31
6 Direct Control & XON	Direct Control:Y/N? XON/XOFF:Y/N?	Direct Control = YES/NO XON/XOFF = YES/NO
7 Term Baud & Duplex	Term Baud Rate: Dplx:1 = half, 0 = full Turnaround Code:	Terminal Baud Rate is the same as number 3. Duplex = 0/1 Turnaround Code = 0-31
8 Sync Codes & Value	Sync Codes: 1/2 Sync Code Value:	Sync Codes = 1/2 Sync Code Value = 1-127

Information, such as stop bits and baud rates, should be provided in your computer User Manual or Software Application Manual.

2. After gathering all the parameters, turn the plotter on.

3. Press the SET-UP key.

4. Press 7, then ENTER keys.

   Display:

   Host Setup Number:
   Press NEXT for MENU

5. Press NEXT key for first menu.

   Display:

   Host Setup Number:
   0 Parity & Bits/Char

6. Press ENTER key for current stored parameter.

   Display:

   Par: 0 = no, 1 = 0, 2 = E
   Bits/Char: 7/8

NOTE

ENTER key must be pressed at each cursor position.

7. Change only those parameters that are incorrectly displayed.

   To change a parameter, key in the new value and press ENTER. (If a wrong value is keyed in, then press the CLEAR key to erase the entry and reenter the correct value.) To leave a parameter unchanged, press ENTER.

   Table 2-3 lists set-up parameters for the 1040GT Series plotters using the RS-232-C serial interface.

NOTE

The default parameters shown in Table 2-3 are firmware set within the ROMPACK. These default values can be changed by the host communication set-up selection described in Chapter Six.

Selection of Initialize EEPROM, Set-Up 14, described in Chapter Six causes all interface parameters to return to the original default value. Therefore, if you make any changes to the interface parameters, record them for safekeeping and reentry in the event they are inadvertently erased.

TABLE 2-3. RS-232-C SERIAL INTERFACE DEFAULT PARAMETERS

	Set-Up 7 Submenu Host Communications	ROMPACK Default (See Note)
0	PARITY	0
	BITS/CHAR	8
1	STOP BITS	1
	CLOCK	0
2	INTERFACE	0
	LISTEN ADDRESS	0
3	HOST BAUD RATE	9600
	MODE (960/PCI)	0
4	TERM MUTING	NO
	CHECKSUM ENABLE	YES
5	ISOCHRONOUS	NO
	END OF MESSAGE CHAR	03
6	DIRECT CONTROL	NO
	XON/XOFF	NO
7	TERM BAUD RATE	9600
	DUPLEX (HALF/FULL)	0
	TURNAROUND CODE	0
8	SYNC CODE (1/2)	1
	SYNC CODE VALUE	002

NOTE

Default values shown are for RS-232-C interfacing. Other interface parameters may vary.

Depending on the nature of your interface and the kind of host computer you have, your set up may differ from the one above. For definitions of these terms, refer to Description of Host Communications Parameters.

8. Review all entries to verify corrections. Press ENTER and NEXT keys until all entries have been viewed.

9. Store all the changes in memory (nonvolatile memory). This is done by pressing SAVE then ENTER keys. Parameter changes are now stored for the user.

10. If you plan to use this plotter with a single host/software package, and you plan to have multiple users, you can save the established parameters in user memory numbers 2,3 and 4. Press the following keys in this order: Select Set-Up 7, ENTER, SAVE, select user number and then press ENTER, Repeat the sequence for the additional user numbers.

11. If more than one host/software package is being used, determine the user number configurations that best suit your purposes and assign the user numbers accordingly.

12. When the parameters have been set, reset the plotter.

Connecting the Plotter to the Host Computer

RS-232-C INTERFACE

The standard interface (and the one shipped with your plotter unless specified otherwise) is the RS-232-C. Look on the rear of your plotter. If the RS-232-C interface is installed, then it should look like Figure 2-1.

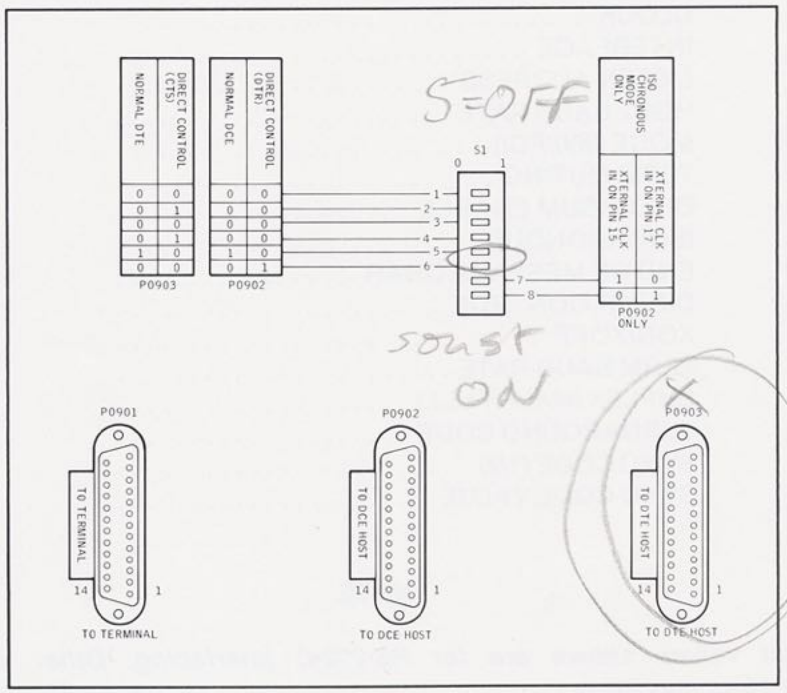


Figure 2-1. RS-232-C Interface Panel

Notice that there are three connectors provided. They are labeled as follows: To Terminal (P0901), To DCE Host (P0902) and To DTE Host (P0903).

To drive the plotter using an on-line computer, connect the cable from the host computer to the Data Terminal Equipment (DTE) connector. Certain kinds of computers, however, also use the Data Communications Equipment (DCE) connector. If a modem is used between the plotter and the host, the host is DCE, and the DCE connector on the plotter interface panel should be used.

You can often use a trial and error approach to this problem. If DTE doesn't work, then try DCE. The terminal connector is most often used to connect an auxiliary terminal (a dumb terminal) for remote host operations. This means that when you are already hooked into a host through either DCE or DTE and require control or information on the host, then you can connect a terminal to this terminal connector and use it in conjunction with the plotter.

If you're using an IBM PC, PC XT, PC AT or compatibles, then connect your computer to the plotter's DTE host connector as follows:

1. Connect the communications or data cable to the correct RS-232-C output port of the host computer or terminal. Your computer technical manual should identify which of the three connectors at the back of your unit is correct.

2. Connect the other end of the host data cable to the appropriate interface panel connector: DTE or DCE. Try DTE first and if that doesn't work, try DCE.

   If a terminal is used, connect it to the terminal connector, P0901, on the interface panel.

3. Set the dual in-line package (DIP) switch marked S1 on the interface panel as required for your software package. Follow the instructions printed on the panel.

4. Turn on the plotter.

5. Load your media.

6. Press AUTO key.

7. Initiate a plot at the host.

8. Evaluate the plotter's performance.

RS-449 INTERFACE

The RS-449 interface panel is much the same as the RS-232-C.

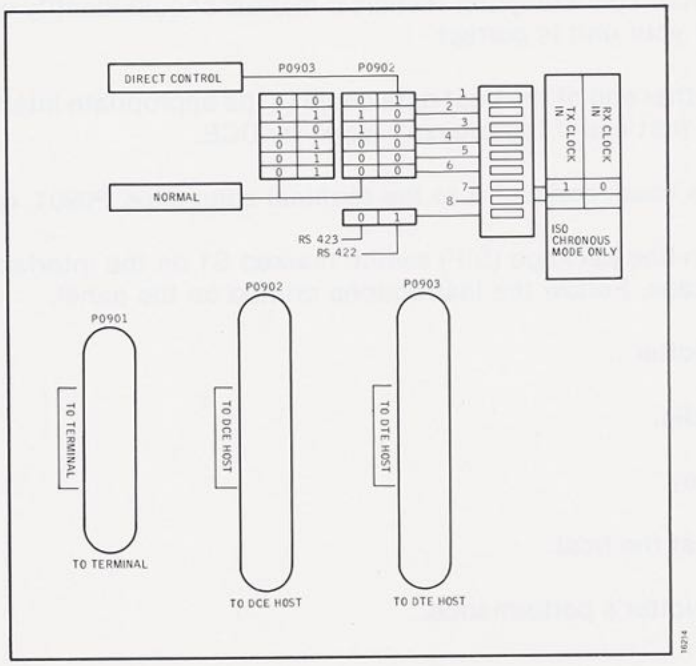


Figure 2-2. RS-449 Interface Panel

The same kind of determinations must be made concerning use of the DTE, DCE or terminal connectors as were encountered with the RS-232-C above. Follow the same procedures as you would for an RS-232-C interface. Refer to your computer technical manual for information on the parameters and requirements for running the plotter.

Set the DIP switches according to the instructions supplied on the interface panel.

IEEE 488 INTERFACE

If an IEEE 488 interface is installed, connect the interface cable from the host into the P0902 connector on the interface panel.

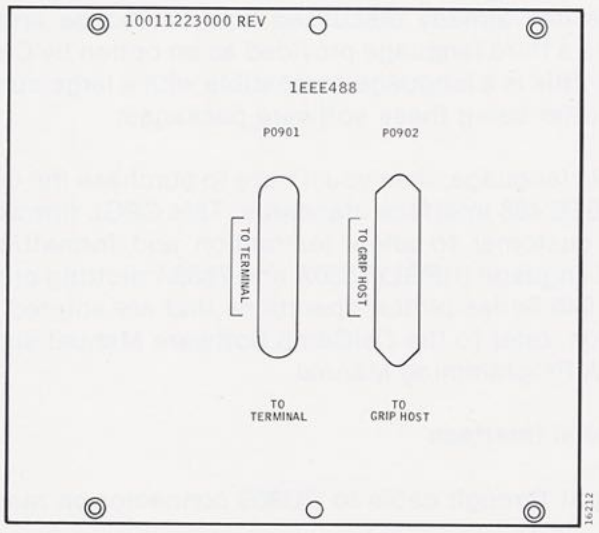


Figure 2-3. IEEE 488 Interface Plate

If a terminal is to be used, connect it to the P0901 connector on the interface panel.

1. Turn on the plotter.
2. Load your media.
3. Press AUTO key.
4. Initiate a plot at the host.
5. Evaluate the plotter's performance.

CPGL OPTION

Introduction

There are a number of graphic plotter languages that allow your plotter to talk to your computer. Two of the most common have been configured in the firmware ROMPACK you received with your plotter: PCI and 960. This User's Guide has already discussed how to choose and configure for each of these languages. However, there is a third language provided as an option by CalComp called CPGL (CalComp Plotter Graphics Language). This is a language compatible with a large number of graphics programs and is necessary to drive the plotter using these software packages.

If your software supports this language, then you'll have to purchase the CPGL ROMPACK. CPGL is compatible with RS-232-C and IEEE 488 interface standards. This CPGL firmware was developed for the convenience of the CalComp customer to allow instruction and formatting compatibility with existing Hewlett-Packard Graphics Language (HPGL) 7580A and 7585A plotting programs. The following information addresses only those 1040 Series plotter operations that are entered from the plotter control panel. For programming information, refer to the CalComp Software Manual supplied by CalComp, as well as your Hewlett-Packard 758XA Programming Manual.

Installation for RS-232-C Serial Interface

1. Connect RS-232-C straight through cable to PO903 connector on rear of plotter and correct output port at host computer.

2. Set switch SW1 on RS-232-C interface panel as follows:

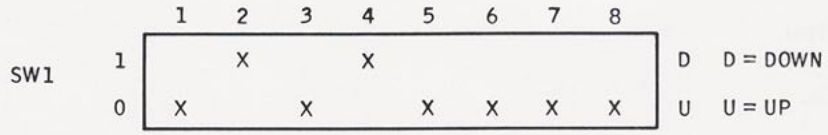


Figure 2-4. Switch Setting

3. Communications Menu (Set-Up 7)

0	Parity
8	** Bits/Char
1	** Stop Bits
0	* Clock
0	Interface
9600	** Host Baud Rate
1	Mode (960/PCI)
Y	* Term Muting
Y	* Checksum Enable
N	* Isochronous
3	* End of Message Char
Y	** Direct Control
N	** XON/XOFF
9600	* Term Baud Rate
0	* Duplex
1	* Sync Code
2	* Sync Code Value

*Ignored, any value OK
**Host dependent

4. Save the parameters. Remember, after pressing SAVE key, select the user number (1 through 4) and press the ENTER key.

5. Press AUTO key.

CPGL Plotter Type

When in Set-Up 7, menu item 9, there is a selection of different plotter types ranging from CLCMP to 7375.

0 = CLCMP
1 = 7580A
2 = 7580B
3 = 7585A
4 = 7585B
5 = 7586B
6 = 7374
7 = 7375

This doesn't mean that CalComp fully supports all these HP models. The reason for these menu selections is that some application software sends an OUTPUT IDENTIFICATION (OI) command and requests the plotter to respond to it. No response or a wrong response causes the host computer to halt or stop processing. There may be other small differences related to speed, number of pens and other physical plotter differences.

No matter what plotter type you select, we only support CalComp's version of HPGL (Hewlett-Packard Graphics Language) — CPGL, which is a subset of the HP command set with some exceptions. (See Table 2-4, CPGL Command Set.)

P1 and P2 Points Function

P1 and P2 points have nothing to do with windowing. They serve two purposes:

- Mirroring — Changing/rotating the direction of P1 and P2
- Scaling — Changing the distance between P1 and P2

Be very careful of the P1 and P2 set-up procedures. Errors may cause distorted or unpredictable plots. The set-up procedure is as follows:

1. Press LIMIT key
2. Move the pen carriage to the desired P1 position, then press ENTER key.
3. Move the pen carriage to the desired P2 position, then press ENTER key.

At power-on, or after plotter reset, P1 and P2 are defaulted at 15 millimeters inside the hardware limit at the origin and diagonal positions, respectively. If only P1 changes position, then P2 automatically moves the same distance and direction relative to P1, but not vice versa. (Changing only P2 does not cause P1 to move the same distance and direction relative to P2.)

After power-on or plotter reset, the plotter does not accept new P1 and P2 values immediately. The plotter has to be put into Auto Mode and back to Manual Mode again. Then it is ready to accept new P1 and P2 values.

After setting the P1 position and before setting P2, pressing the ORIGIN RETURN key causes the pen carriage to move to the P1 position. That doesn't mean origin has been changed to P1, but just reminds you where the current P1 position is located so you can continue setting up P2. In other words, current P1 and P2 positions can be checked by pressing the LIMIT key, then pressing the ORIGIN RETURN once for P1 position, twice for P2 position.

To reset the position of P1 and P2 to their default locations, press the CLEAR key.

CPGL Command Support

CalComp designed the CPGL to allow customers to connect a 1040GT plotter to their HPGL data source. Some HPGL commands do not produce the same output on the HP plotters as they do on the 1040GT plotters. Below is a list of these commands, both for HPGL A (the original version) and HPGL B. Consider HPGL A to be a subset of HPGL B.

1040GT Restrictions

When using CPGL Mode, several of the functions on the plotter do not work. These limitations are as follows:

- No Plot Manager
- Scale Ratio is restricted
- Rotation is restricted to 0 or 90 degrees
- 960 and PCI Modes are locked out
- Test 14, Input Monitor Dump (IMD), is disabled
- Auto Logon and Send Messages are disabled

The New Plot function operates differently in CPGL Mode than in any other mode. If you use the NEW PLOT key while in CPGL, the entire plot that follows is relocated by an amount equal to the difference between the old origin point and the new origin point.

Scale Ratio (Set-Up 1, steps 4, 5 and 6) is restricted to 1:1 when using CPGL firmware. User unit scaling is controlled by the host software.

Rotation (Set-Up 1, step 7) is restricted to 0 or 90 degrees.

Mirroring (Set-Up 2) is set when the P1 and P2 points are designated; therefore, Set-Up 2 is disabled and cannot be entered through control panel selection if you are using CPGL firmware.

Like mirroring, Media Compensation (Set-Up 4) is set when the P1 and P2 points are set. For the same reason, Set-Up 4 is disabled and cannot be entered through control panel selection if you are using CPGL firmware.

Host Communications, Set-Up 7, is different with CPGL. The following Host Communications Parameters are available with CPGL.

- Parity
- Bits/Characters
- Stop Bits
- Interface
- Host Baud Rate
- CPGL Plotter Type

The following host communication parameters can be used with CPGL, but have no effect.

- Clock
- Mode
- Muting
- Checksum
- Isochronous
- End of Message
- Direct Control
- XON/XOFF
- Term Baud Rate
- Duplex
- Sync Code
- Sync Code Value

TABLE 2-4. CPGL COMMAND SET

INSTRUCTION GROUP	MNEMONIC	STATUS
DEVICE CONTROL		
Default Instruction, DF	DF	2
Initialize Instruction, IN	IN	2
Not Ready Instruction, NR	NR	*
SCALING, WINDOWING AND ROTATION		
Input P1 and P2 Instruction, IP	IP	*
Output P1 and P2 Instruction, OP	OP	*
Scale Instruction, SC	SC	*
Output Hard-Clip Limits Instruction, OH	OH	*
Input Window Instruction, IW	IW	2
Output Window Instruction, OW	OW	B
Rotate Coordinate System Instruction, RO	RO	*
PLOTTING WITH VARIABLES		
Pen Select Instruction, SP	SP	2
Pen Instructions, PU and PD	PU, PD	*
Plot Absolute Instruction, PA	PA	*
Plot Relative Instruction, PR	PR	*
PEN CONTROL AND PLOTTING		
Automatic Pen Pickup Instruction, AP	AP	1
Acceleration Select Instruction, AS	AS	*
Force Select Instruction, FS	FS	1
Velocity Select Instruction, VS	VS	2
Group Pen Instruction, GP	GP	B
Select Pen Group Instruction, SG	SG	B

TABLE 2-4. CPGL COMMAND SET (cont.)

INSTRUCTION GROUP	MNEMONIC	STATUS
CIRCLES, ARC AND POLYGONS		
Chord Tolerance Instruction, CT	CT	2
Circle Instruction, CI	CI	2
Arc Instructions, AA and AR	AA, AR	2
Fill Type Instruction, FT	FT	B
User Defined Fill Type Instruction, UF	UF	B
Pen Thickness Instruction, PT	PT	B
Fill Wedge Instruction, WG	WG	B
Edge Wedge Instruction, EW	EW	B
Fill Rectangle Instructions, RA and RR	RA, RR	B
Edge Rectangle Instructions, EA and ER	EA, ER	B
Polygon Mode Instruction, PM	PM	B
Edge Polygon Instruction, EP	EP	B
Fill Polygon Instruction, FP	FP	B
PLOT ENHANCEMENT		
Tick Instructions, XT and YT	XT, YT	*
Tick Length Instruction, TL	TL	*
Symbol Mode Instruction, SM	SM	2
Line Type Instruction, LT	LT	2
CHARACTERS		
Designate Standard Character Set Instruction, CS	CS	2
Designate Alternate Character Set Instruction, CA	CA	2
Select Standard Set Instruction, SS	SS	2
Select Alternate Set Instruction, SA	SA	2
Label Instruction, LB	LB	2
Define Terminator Instruction, DT	DT	*
Extra Space Instruction, ES	ES	*
Absolute Direction Instruction, DI	DI	*
Relative Direction Instruction, DR	DR	*
Character Plot Instruction, CP	CP	*
Absolute Character Size Instruction, SI	SI	*
Relative Character Size Instruction, SR	SR	*
Character Slant Instruction, SL	SL	2
Label Origin Instruction, LO	LO	*
Buffered Label String Instruction, BL	BL	*
Output Label Length Instruction, OL	OL	2
Print Buffered Label Instruction, PB	PB	2
Character Chord Angle Instruction, CC	CC	2
User-Defined Character Instruction, UC	UC	A
Downloadable Character Instruction, DL	DL	B

TABLE 2-4. CPGL COMMAND SET (cont.)

INSTRUCTION GROUP	MNEMONIC	STATUS
OTHER CHARACTER MODE SELECTION		
Character Selection Mode Instruction, CM	CM	B
Designate Character Set into Slot Instruction, DS	DS	B
Invoke Character Slot Instruction, IV	IV	B
DIGITIZING		
Digitize Point Instruction, DP	DP	A
Digitize Clear Instruction, DC	DC	A
Output Digitized Point and Pen Status Instruction OD	OD	A
GENERAL PROGRAMMING INSTRUCTIONS		
Input Mask Instruction, IM	IM	2
Output Actual Position and Pen Status Instruction, OA	OA	2
Output Commanded Position and Pen Status Instruction, OC	OC	*
Output Error Instruction, OE	OE	
Output Factors Instruction, OF	OF	*
Output Identification Instruction, OI	OI	*
Output Options Instruction, OO	OO	*
Output Status Instruction, OS	OS	*
Output Carousel Type Instruction, OT	OT	2
PLOTTING WITH ROLL MEDIA		
Enable Cut Line Instruction, EC	EC	B
Advance Full-Page Instruction, AF	AF, PG	B
Advance Half-Page Instruction, AH	AH	B
Advance Frame Instruction, FR	FR	B
HP-IB DEVICE CONTROL		
Set Plotter Configuration Instruction, ESC. @	** ESC.@	B
Output Identification Instruction, ESC.A	ESC.A	B
Output Buffer Space Instruction, ESC.B	ESC.B	*
Output Extended Error Instruction, ESC.E	** ESC.E	B
Abort Device Control Instruction, ESC.J	ESC.J	B
Abort Graphics Instruction, ESC.K	** ESC.K	B
Output Buffer Size Instruction, ESC.L	** ESC.L	B
Output Extended Status Instruction, ESC.O	** ESC.O	*
Set Monitor Mode Instruction, ESC.Q	ESC.Q	B
Reset Instruction, ESC.R	ESC.R	B
Output Memory Size Instruction, ESC.S	ESC.S	B
Configure Memory Instruction, ESC.T	ESC.T	B
Reaction to Bus Commands, DCL,SDC, and IFC	DCL,SDC,IFC	*

TABLE 2-4. CPGL COMMAND SET (cont.)

INSTRUCTION GROUP	MNEMONIC	STATUS
RS-232-C DEVICE CONTROL		
Plotter On Instruction, ESC.(or ESC.Y	ESC.(or ESC.Y	B
Plotter Off Instruction, ESC.) or ESC.	ESC.) or ESC.Z	B
Set Plotter Configuration Instruction, ESC.@	ESC.@	*
Output Identification Instruction, ESC.A	ESC.A	B
Output Buffer Space Instruction, ESC.B	ESC.B	*
Output Extended Error Instruction, ESC.E	ESC.E	*
Set Handshake Mode 1 Instruction, ESC.H	ESC.H	*
Set Handshake Mode 2 Instruction, ESC.I	ESC.I	*
Abort Device Control Instruction, ESC.J	ESC.J	*
Abort Graphic Instruction, ESC.K	ESC.K	*
Output Buffer Size Instruction, ESC.L	ESC.L	*
Set Output Mode Instruction, ESC.M	ESC.M	*
Set Extended Output and Handshake Mode Instruction, ESC.N	ESC.N	*
Output Extended Status Instruction, ESC.O	ESC.O	*
Set Handshake Protocol Instruction, ESC.P	ESC.P	*
Set Monitor Mode Instruction, ESC.Q	ESC.Q	B
Reset Instruction, ESC.R	ESC.R	B
Output Memory Size Instruction, ESC.S	ESC.S	B
Configure Memory Instruction, ESC.T	ESC.T	B

Note: The IC and OB commands are not supported by CalComp as HP has already discontinued their support.

* Compatible
1 Not operational, syntax errors are detected
2 Different result, see incompatibilities/differences
A Ignored — unsupported HPGL A features
B Ignored — unsupported HPGL B features

TABLE 2-5. HPGL/CPGL DIFFERENCES

AA Arc

Deviations are implemented by converting the deviation distance into angle degrees and following the CT selection method.

AR Arc

Deviations are implemented by converting the deviation distance into angle degrees and following the CT selection method.

CA Designate Alternate Character Set

HPGL fonts 0 through 5 are supported with the exception of the 34 special symbols. HPGL fonts 10 through 15 are mapped to HPGL fonts 0 through 5. Proportional spacing is not supported.

TABLE 2-5. HPGL/CPGL DIFFERENCES (cont.)

CC Character Chord Angle
Chord tolerances are mapped to the angles available for characters in the 104X. If the command angle is between two available angles, the smaller available angle is used.

CI CIRCLE
Deviation changes are implemented by converting the deviation distance into angle degrees and following the CT selection method.

CS Designate Standard Character Set
HPGL fonts 0 through 5 are supported with the exception of the 34 special symbols. HPGL fonts 10 through 15 are mapped to HPGL fonts 0 through 5. Proportional spacing is not supported.

CT Chord Tolerance
Chord tolerances are mapped to the angles available in the 104X. If the command angle is between two available angles, the smaller available is used.

DF Default
Defaults are not set for unimplemented instructions, or noncompatible hardware functions.

IM Input Mask
IM doesn't effect error LED since there is none. Also the IEEE 488 features of IM are only partially implemented.

IN Initialize
Initialization for unimplemented instructions or noncompatible hardware functions are not acted upon.

IW Input Window
After receiving an effective window command, the pen is moved to the MIN position, then moved to MAX position and returned to the previous position instead of no action in HPGL.

LB Label
Backspace and inverse line-feed characters are ignored in 104X.

LT Line Type
Adaptive mode may vary plus or minus one repetition from HPGL. End points are not affected. Line type 0 (LTO) defaults to solid line mode. Line types 1 and 4 are drawn in the same pattern as HPGL except that a small dash is used as a dot.

OA Output Actual Position and Pen Status
The output is the actual pen position. CPGL takes into account front panel transformations that are not available in HPGL.

OC Output Commanded Position and Pen Status
The commanded X and Y coordinates may be plus or minus 1 step different from HPGL. This is caused by the conversion from plotter units to user units or from user units to plotter units when scaling mode is turned on/off.

OL Output Label Length
The output is the ending pen position rather than the right most pen down position as in HPGL.

TABLE 2-5. HPGL/CPGL DIFFERENCES (cont.)

OT Output Carousel Type

HPGL uses different types of carousels for different type pens. A message is returned to Host which states "Unknown Type."

PB Print Buffered Label

Vertical tabs and backspaces are ignored in 104X.

SA Select Alternate Set

HPGL fonts 0 through 5 are supported with the exception of the 34 special symbols. HPGL fonts 10 through 15 are mapped to HPGL fonts 0 through 5. Proportional spacing is not supported.

SL Character Slant

CPGL character slant is limited to plus or minus 45 degrees. When the value received is greater than 45 degrees or less than 45 degrees, the value is treated as plus or minus 45 degrees.

SM Symbol Mode

The symbol mode character is drawn at the end of each vector, but is not centered on the plotted point, except centered characters (ASCII 65 through 75 of character set 5).

SS Select Standard Set

HPGL fonts 0 through 5 are supported with the exception of the 34 special symbols. HPGL fonts 10 through 15 are mapped to HPGL fonts 0 through 5. Proportional spacing is not supported.

VS Velocity Select

This command has different values for CPGL plotters than for HPGL plotters. In addition, velocities below 5 CM/S are set to 5 CM/S as default.

** @, E, K, L, O
Escape sequences above are supported in IEEE488 CPGL even though they are HP "B" features.

ROMPACK INSTALLATION AND UPDATES

Introduction

Occasionally, CalComp issues an updated revision of the ROMPACK you are using with your plotter. This updated version can be installed by removing the existing ROMPACK and replacing it as described in Chapter One of this User's Guide. Ensure the key blocks on the ROMPACK connector are lined up with the key blocks on the plotter connector prior to installing the ROMPACK.

Depending on the firmware changes within the ROMPACK one of the functions that may occur when you install a new ROMPACK is that the EEPROM would be initialized. The result is the user memory within the plotter is erased and reloaded with the default values from the new ROMPACK. All existing user parameters (Set-Up 0 through Set-Up 16) are returned to the default value established by the new ROMPACK.

Prior to replacing a ROMPACK, record those user parameters that were changed from their default value. Reenter and save these parameters after replacing the ROMPACK.

Installing the ROMPACK

1. Turn the power off and remove the existing ROMPACK. Insert the new ROMPACK. Turn the power on.

2a. If the message reads:

Display:

EEROM INIT
Please Standby

wait for approximately 50 seconds or until the message reads:

Display:

Position Carriage &
Load Paper Please

(Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

Load the media and continue with the procedures in Chapter One of this User's Guide and disregard step 2b.

2b. However, if the message reads:

Display

Invalid User Number
Default to User - 1

or

User Default Setup
Entered Data Lost

wait about 30 seconds, this message should then appear:

Display:

Position Carriage &
Load Paper Please

(Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

If the above message appears, it is necessary to do a complete EEPROM initialization procedure. This procedure can be found in Chapter Six, Set-Up 14.

CHAPTER THREE
OPERATING THE PLOTTER

MEDIA INSTALLATION/REMOVAL

Introduction

There are several fundamental procedures you must know to run the 1040GT Series plotter effectively. These include the loading and unloading of the paper or other media, the installation and removal of the drums, and the loading of pens. Some of these topics have been covered in Chapter One but are repeated here in more detail. Examples of all possible configurations of the four 1040GT plotters are provided.

Depending on the plotter model, the 1040GT plotter draws on cut sheet, unpunched roll or punched roll media. Media can be paper, polyester film, vellum or a number of other materials prescribed for a particular machine or operation. (For a full discussion of media, see Chapter Four.)

Chapter Two discussed the plotter interfacing to a host and the set-up requirement for different host communication parameters. You probably have already programmed the plotter using the message display prompts and keyboard keys to enter these parameters into the plotter memory.

The topics discussed in Chapter Three also require using the message display prompts and keyboard keys to enter additional variations into the plotter memory. Throughout this chapter, reference is made to the set-up procedures for entering this data into memory. Additional detail for each of the set-up procedures can be found in Chapter Six.

Variations, such as changing media width and media type (cut sheet or roll) need to be programmed into the plotter. If your plotter uses more than one drum, this also requires changing plotter memory. Each drum has a specific compensation value referred to as scale factor that is calculated during the original factory set up to compensate for any mechanical differences in drum size. To avoid having to recalculate the scale factor compensation, always record the factory value of the X- and Y-axis scale factor for a permanent record prior to exchanging any plotter drums.

The pen turret holds the pens and rides on a stationary rail. All inking takes place over the drum and under the movable pen turret. Cut sheet operations can be performed on the four plotters while the 1042GT plots using unpunched roll media. In either the cut sheet or unpunched roll operation, the media is held taut over the drum through the interaction of the media passing between the dual pinch rollers and the grit bands on either side of the drum. Using punched roll media to plot is performed only by the 1044GT. During this operation the punched roll media is held taut over the drum by a combination of a sprocketed drum and an automatic vacuum system that is standard equipment on the 1044GT plotter.

TABLE 3-1. PLOTTER/MEDIA TYPES

Plotter Type	Media Type
1042GT	Cut Sheet Unpunched Roll
1043GT	Cut Sheet
1044GT	Cut Sheet Punched Roll

Cut Sheet Media Installation/Removal

Before beginning installation, decide what size and kind of media is needed for this operation. The maximum media length for Cut Sheet Mode is 48-inches. The plotter accommodates drawings sized ANSI A through E, Architectural F, and ISO A0 through A4.

To load and unload cut sheet media using the various plotters follow the general procedure below:

1. Turn the plotter on and raise the cover.

   Two information messages appear momentarily, and then the plotter initializes.

   Display:

   Lower the Cover
   Please Load PAPER

2. Place the media on the front platen with the front edge of the media pointing toward the drum. (Remember to lock the front and rear platens into position.)

3. Slide the media under the pinch rollers and the rail until its length is evenly divided between the back and the front.

4. Align the right edge of the media with the alignment mark (a straight line) on the right margin of the platen.

5. Lift the left pinch release lever to the UP or unlock position and move the left pinch roller right or left to a position near the left edge of the media.

   Ensure the pinch roller is not straddling the media edge, but is completely on the media surface. Gently move the release lever back to the DN or lock position.

   Don't try to move the right pinch roller. It should remain stationary. However, ensure the right pinch roller is on the media and not straddling the media edge.

6. Check the right edge alignment mark on the platen again for proper alignment of the media with the plotter. Also, check to see where the grit rings are in relation to the pinch rollers and the media. The pinch rollers should be directly over the grit rings, never half on and half off. Ensure that the left pinch roller is positioned inside the left margin of the media. Otherwise, it can result in media warping and tearing.

7. Hold the media lightly in place with your left hand and close the safety cover.

   Press the LOAD/UNLOAD key.

   The pinch rollers automatically lower to grip the media and the media feeds across the drum. Release the media.

   Display:

   Seeking Paper Edges
   Please Standby

8. The media and pen carriage move as the plotter determines the upper left limit and the lower right limit for this plotting application. With these limits defined, the plotter returns to the point of origin and stops if the pen turret has not been installed. The following message reads:

   Display:

   Install TURRET
   RESET when corrected

   If you have installed the pen turret, then the following message reads:

   Display:

   Ready
   Press AUTO to Plot

9. Remain in the Manual Mode to establish any set-up or test functions or to complete any other installation procedures.

   When ready, press the AUTO/MANUAL key. This sets the plotter in the Auto Mode, ready to accept plotting data from the connected host.

10. When the plotting is finished, press the LOAD/UNLOAD key again. The pinch rollers release and the drawing can be removed.

Roll Feed Media Installation (Model 1042GT)

Unpunched roll (continuous sheet) and cut sheet media can be used by the 1042GT.

Although the 1042GT is shipped in the Cut Sheet Mode, notice that it possesses a pair of hubs on both front and rear for feed and take-up cores. The take-up core is standard equipment delivered with each 1042GT.

To load the plotter for continuous roll media, follow these instructions:

1. Because the plotter should be set for a default of cut sheet media, reset the media feed values. Press the SET-UP key.

   Display:

   ```
   Setup Number:
   Press NEXT for Menu
   ```

2. Press 1, 0, then ENTER keys.

   Display:

   ```
   1042GT    Media?              Cut = 0
             Roll- 15 = 1, 36 = 2,  Dis = 3
   ```

3. Press the numerical key corresponding to the plotter model and media roll size being used.

4. Press the ENTER, SAVE key, then ENTER key.

5. Press the AUTO/MANUAL key twice. This procedure returns you to the following display:

   Display:

   ```
   Position Carriage &
   Load Paper Please
   ```

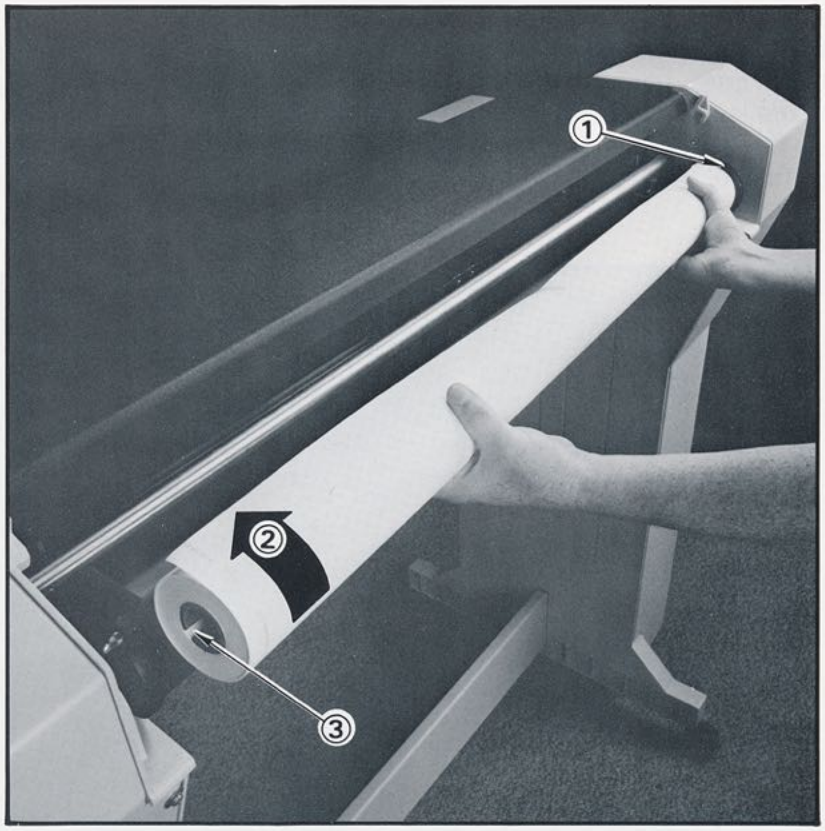
   (Use the keyboard controls or joystick to manually position the carriage a minimum of 5 inches from the right side support. This allows correct carriage sensor position response during the automatic load routine.)

6. Install the supply roll. (This is done by moving to the back of the plotter; however, instructions are given as if you were looking at the plotter from the front.) Position the roll so that the media feeds from the top. See Figure 3-1.

   The spool on the left side is spring mounted and can be pressed in to the left, allowing the left end of the roll to be seated. Grasping the supply roll, position the left end on the spool at the left side. Match the notch on the left end of the roll to the key on the left spool. Using the core, apply left-side pressure to the spring-mounted spool on the left end and move the right-end notch into alignment with the key on the right spool.

   Gently release the pressure until the supply roll is properly seated.

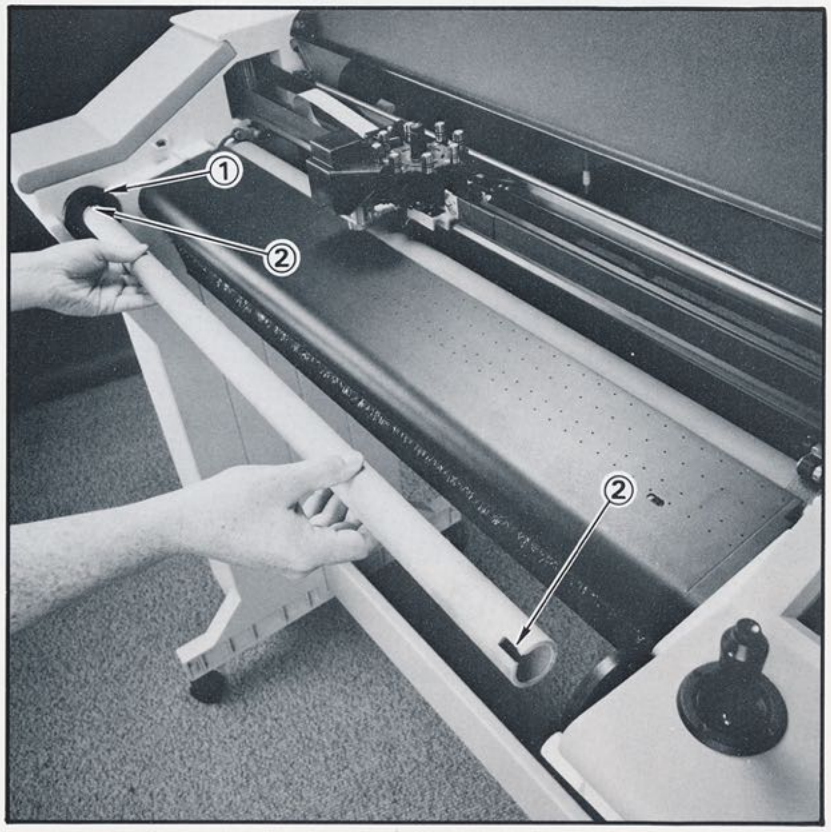
   Position the media hold-down bracket on the right end of the roll. This maintains tension on the supply roll as the media unwinds.



① *Adjustable Spool* ② *Paper Path* ③ *Key Slot*

Figure 3-1. Loading Supply Roll

7. Install the take-up media core onto the front take-up spools (see Figure 3-2). The spool on the left side is spring mounted and can be pressed in to the left, allowing the left end of the roll to be seated. Grasping the media core, position the left end onto the idle spool at the left side. Press in until the right end of the core is alligned with the right spool. The spool on the right side has a single key that, when matched to the notched end of the media core, holds the core secure. Seat the right end of the core into the right spool, release the core pressure to the left and allow the core to seat into place.



① *Adjustable Spool* ② *Key Slot*

Figure 3-2. Loading Take-up Core

8. Pull the media through from the back. Again, ensure the media feeds from the top. Thread the media under the idler roller, over the back platen, across the drum and under the pinch rollers, then over the front platen, and under the take-up core as shown in Figure 3-3.

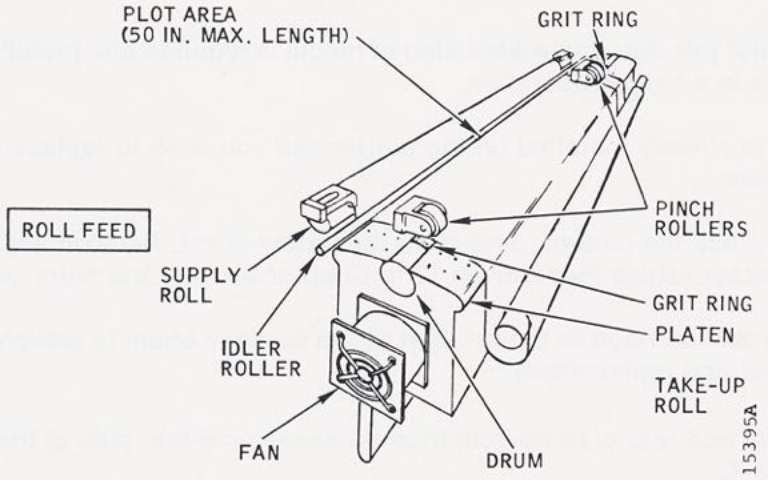


Figure 3-3. Loading Roll Media

9. Tape the cut edge of the roll to the take-up core using a small piece of tape. Ensure the media is straight. Manually rotate the take-up core two turns, taking up the slack and applying an even tension across its width.

   The front and rear left take-up spools are adjustable to compensate for slight variations in media widths and inner core lengths. These spools are adjusted so that the face of the spools almost touch the edge of the media. If the left spool is adjusted too tightly it causes the media to bunch up on the edge. If the left spool is adjusted too loosely it allows the media to weave when it is being rolled up. To adjust either front or rear spools, hold onto the media core or roll with one hand and rotate the flange of the spool with the other hand.

10. Close the safety cover. Press the LOAD/UNLOAD key on the console. The pinch rollers lower to grip the media and hold it against the drum. The following message appears momentarily:

    Display:

    Seeking Paper Edges
    Please Standby

11. At the end of a successful load, the following appears:

    Display:

    Ready
    Press AUTO to Plot

Exchanging Grit Drum for Sprocketed Drum (Model 1044GT)

All model 1044GT plotters are shipped with two drums: a grit drum for use with cut sheet media and a sprocketed drum for punched roll media.

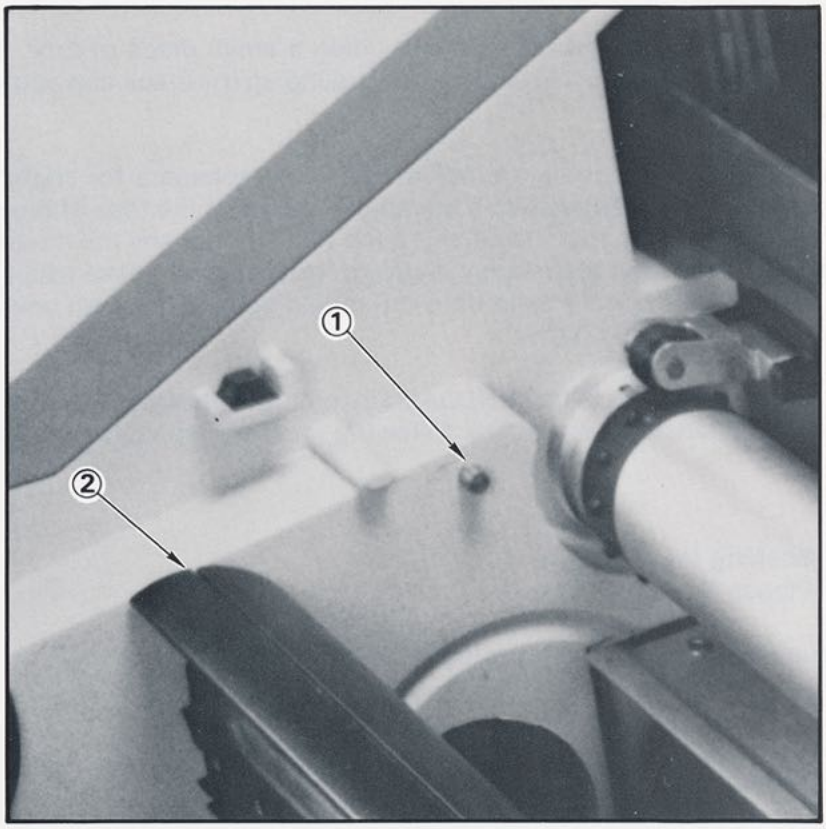
Before beginning any plot job, determine what kind of media is required and install the appropriate drum. Exchanging drum types is a simple operation.

Assume the grit drum is already installed on the plotter and you wish to replace it with the sprocketed drum. Proceed as follows:

1. Turn the power off, lock the casters, and raise the safety cover. Remove any media on the plotter. Record the scale factor values (See Set-Up 13 in Chapter Six.) for the drum being replaced.

2. Slide the pen turret and carriage to the far right of the carriage beam to prevent damage to the turret during drum removal and replacement.

3. Pull and lift the front and rear platens from their recesses on either side of the plotter and fold them down. See Figure 3-4.



① *Platen Dowel Pin*

② *Platen In Down Position*

Figure 3-4. Lowering Platen (1044GT)

4. Release the lever on the left pinch roller assembly and slide it to the right until it contacts the pen carriage. This allows easy access to the left edge of the drum.

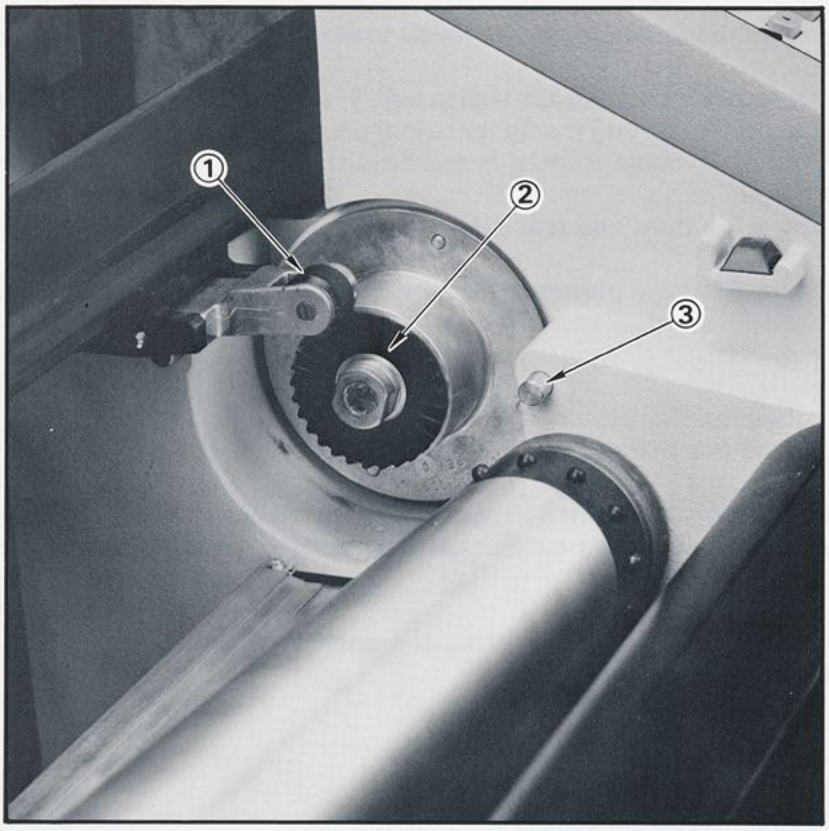
5. Holding the installed grit drum with both hands, apply side pressure toward the left end. The left end of the drum is spring loaded and gives as side pressure is applied. This allows you to disengage and clear the right end of the drum from its gear mesh socket.

6. To remove the drum from the plotter, move the drum down and pull it forward. Do not strike the turret mechanism or the platen guide pins.

   Lay the grit drum in a safe location. A dented or damaged drum does not work properly.

   Now, install the sprocketed drum. See Figure 3-5.

7. Record the scale factor data from the tag on the end of the drum. Notice that the left end of this drum has a bearing. Guide this end onto the shaft in the left drum socket, apply side pressure to the left, and press in. The left spring gives slightly, allowing you to place the right end of the drum into place. Do not strike the turret mechanism or the platen guide pins.



① *Pinch Roller* ② *Drum Coupling Device* ③ *Platen Dowel Pin*

Figure 3-5. Sprocketed Drum Installation (1044GT)

8. Ensure the drum's right-end gear mesh properly with the coupling device for proper drum rotation.

9. When the drum is correctly seated, release the side pressure on the left side of the drum. Rotate the drum several revolutions by hand to ensure complete freedom of movement.

10. Return the pinch roller to the left side of the plotter. Ensure the pinch roller mechanism does not ride on the drum's sprocket teeth; this interferes with the plotter's operation.

    Gently lower the pinch roller lever into place.

11. Return the pen carriage to the center of the beam and turn power on.

12. Using Set-Up 13 in Chapter Six, enter the scale factor values for the newly installed drum.

13. Using Set-Up 10 in Chapter Six, enter the media type selection.

14. Load the media and proceed with the plot. (See the following information for assistance.)

Loading Punched Roll Media (Model 1044GT)

Once the sprocketed drum is installed, you're ready to load the punched roll media.

A new roll of CalComp media measures 120 feet in length and a fresh roll of polyester film is 60 feet long. If you're using a partial roll of plotting media, ensure there is sufficient media left on the roll to complete the task. Select a new roll of media if there is any doubt.

1. Disengage and lower the front and rear platens.

2. Power the plotter on. After the plotter completes its initialization, the following message appears:

   Display:

   Position Carriage &
   Load Paper Please

   (Use the keyboard controls or joystick to manually position the carriage a minimum of 5 inches from the right side support. This allows correct carriage sensor position response during the automatic load routine.)

3. Program the plotter to accept roll media. This procedure requires selecting Set-Up 10 by pressing the SET-UP key. (See Chapter Six.)

   Display:

   Setup Number:
   Press NEXT for MENU

4. Press 1, 0, and then ENTER keys.

   Display:

   Media? CUT = 0
   Roll-15" = 1 36" = 2

5. Press 2 followed by the ENTER key to select the 36-inch media. To select the 15-inch media, press 1, then ENTER keys. To save this parameter beyond the present session, press the SAVE key, assign a user number, then press ENTER key.

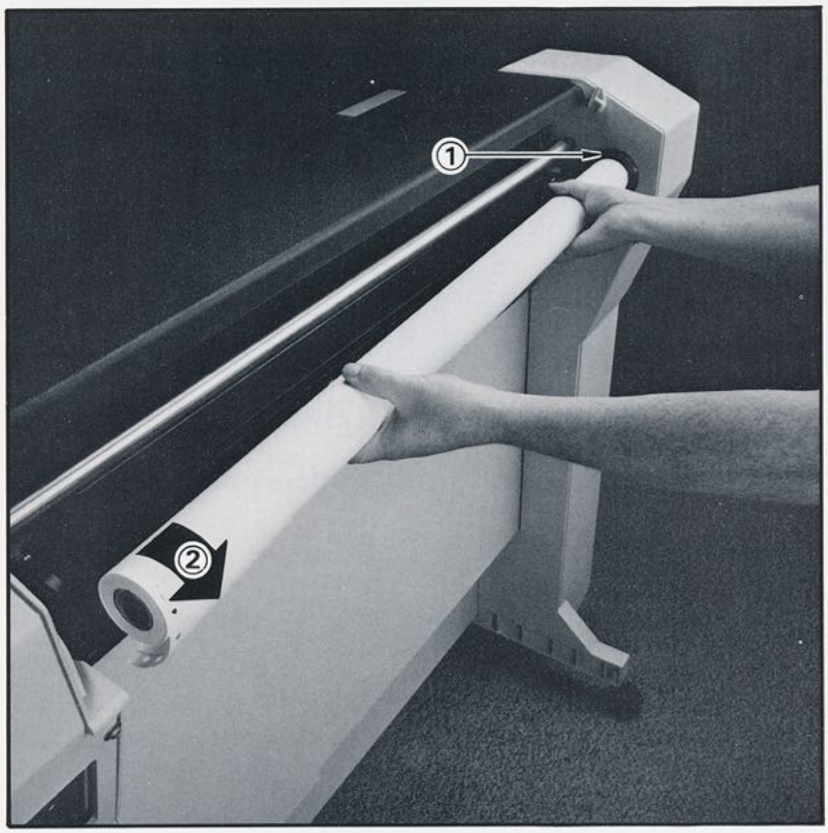
6. Press AUTO/MANUAL key twice to return to the READY message.

7. Unlock the wheel casters and move the plotter away from any obstructions. Relock the casters. Turn the power off.

8. Install the supply roll. (This is done by moving to the back of the plotter; however, instructions are given as if you were looking at the plotter from the front.) Position the roll so that the media feeds from the bottom. See Figure 3-6.

   The spool on the left side is spring mounted and can be pressed in to the left, allowing the left end of the roll to be seated. Grasping the supply roll, position the left end on the spool at the left side. Match the notch on the left end of the roll to the key on the left spool. Using the core, apply left-side pressure to the spring-mounted spool on the left end and move the right-end notch into alignment with the key on the right spool.

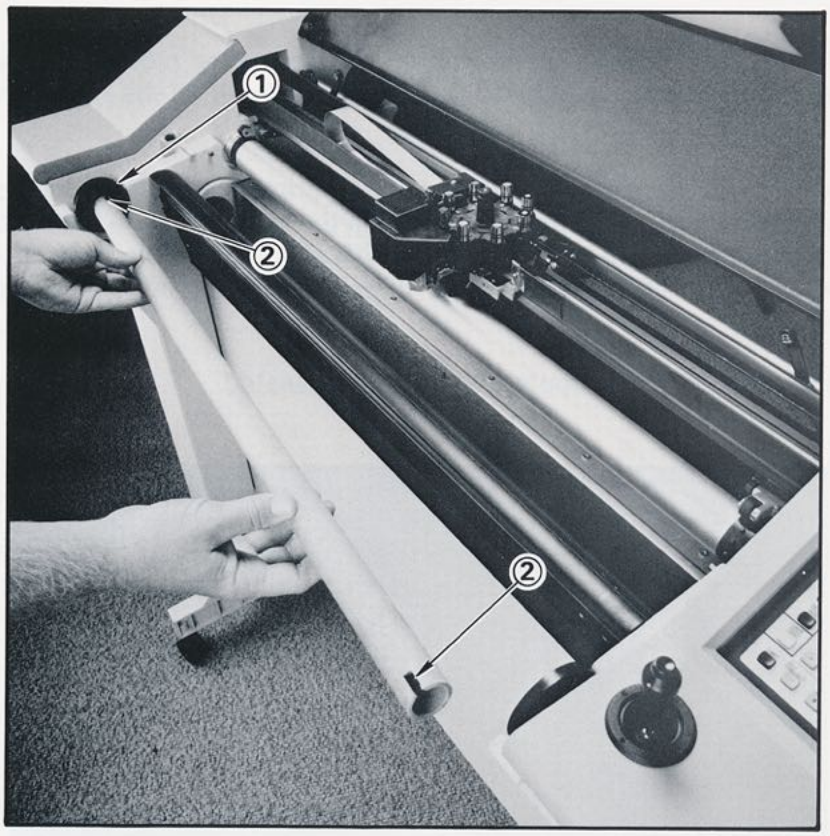
Gently release the pressure until the supply roll is properly seated.



① *Adjustable Spool* ② *Paper Path*

Figure 3-6. Loading Supply Roll (1044GT)

9. Install the take-up media core onto the front take-up spools as shown in Figure 3-7. The spool on the left side is spring mounted and can be pressed in to the left, allowing the left end of the roll to be seated. Grasping the media core, position the left end onto the idle spool at the left side. Press in until the right end of the core is aligned with the right spool. The spool on the right side has a single key that, when matched to the notched end of the media core, holds the core secure. Seat the right end of the core into the right spool, release the core pressure to the left and allow the core to seat into place.



(1) *Adjustable Spool* (2) *Key Slot*

Figure 3-7. Loading Take-up Core (1044GT)

10. Move to the back of the plotter and unroll the media. Again, ensure the media feeds from the bottom. It is easier to fold the edge of the media to a point and feed it through.

11. Move to the front of the plotter. Grasp the right and left sides of the media and pull about 3 feet up and forward so as to clear the drum sprockets. This method prevents the perforations on either side of the media from tearing.

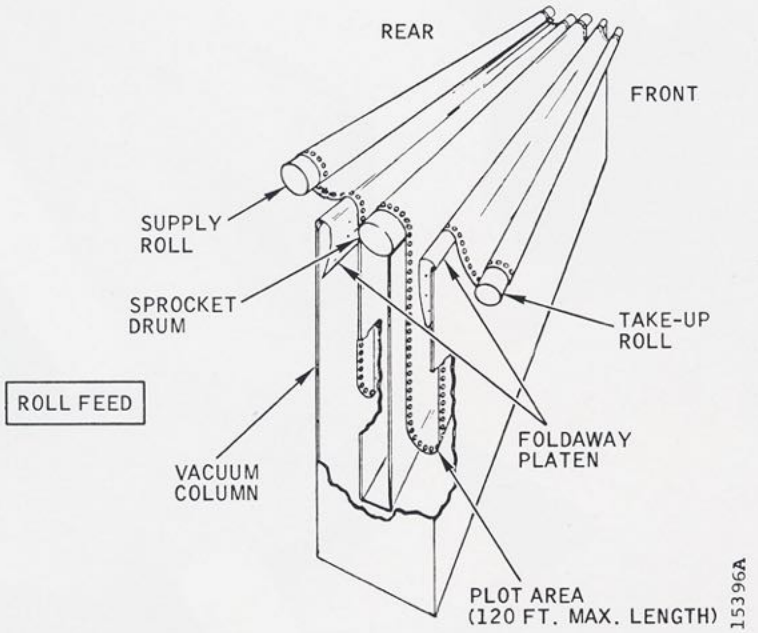
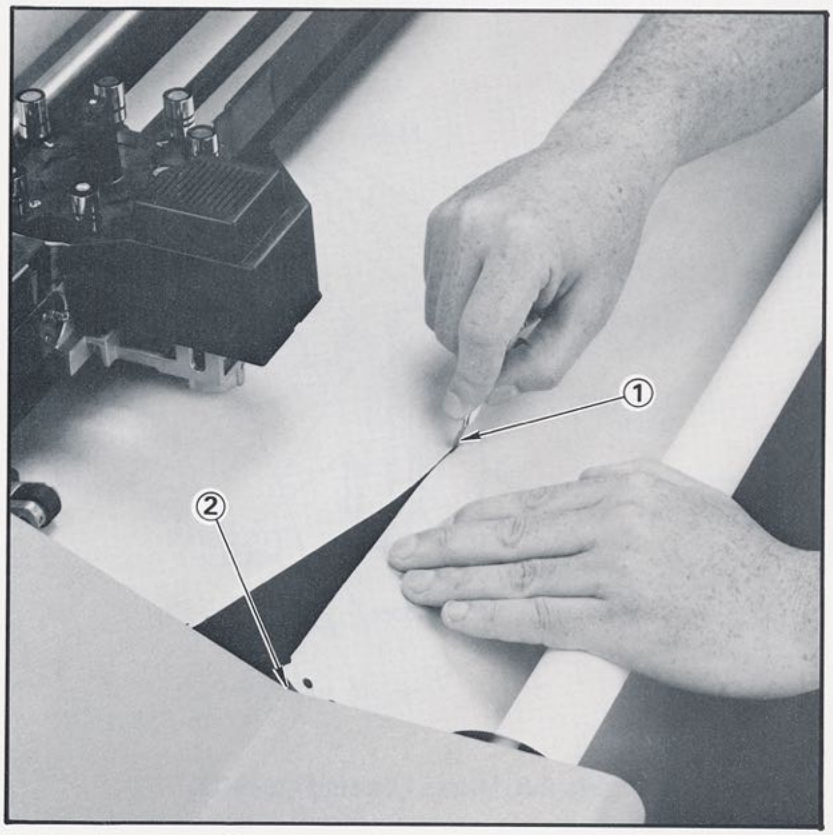


Figure 3-8. Media Loading (1044GT)

12. Cut off and discard any torn or uneven media end with the media cutter (see Figure 3-9). Make an even cut by using the cutting guide on the front score of the lowered platen. Pull at least 3 feet of media up and forward over the drum sprockets.



① *Knife* ② *Cutting Guide On Platen*

Figure 3-9. Cutting the Media

13. While holding the cut edge of the media, allow the extra media to fall into the front vacuum cannister.

14. Line up the media so that the punched holes on the sides of the media match up with the sprocket teeth on both ends of the drum. Tick marks on the media must line up on both the right and left edges. Place the media on the right sprockets first. The left sprockets slide slightly left and right to facilitate proper alignment and to compensate for varying media widths due to changes in humidity.

15. Feed the leading edge of the media under the take-up roll.

16. Manually unroll enough media (approximately 3 feet from the supply roll) so that it loops at least halfway down the rear vacuum cannister. Verify that a similar amount is in the front cannister.

17. Hand roll the released media onto the take-up core, about 2 revolutions, while holding the core tightly. Ensure that the media is tightly and evenly wound and that it loops at least 15 inches down into the front vacuum cannister.

18. Lower the safety cover.

19. Power-on.

20. While holding the media core carefully, press the LOAD/UNLOAD key. As the media take-up core begins to spin, hold the core with both hands and gently help tighten the media onto the take-up core.

    Display:

    Turning ON Vacuum
    Please Standby

NOTE

If the media take-up roll starts unwinding and the following message displays, "NO Paper in Path", there is not enough media in the front vacuum cannister. Repeat step 16, and try again to load media.

If the media is properly loaded, the vacuum automatically turns on and draws the media to the appropriate depth in the vacuum cannisters. The plotter then cycles through its loading program and displays the following message:

Display:

Ready
Press AUTO to Plot

The front and rear left take-up spools are adjustable to compensate for slight variations in media widths and inner core lengths. These spools are adjusted so that the face of the spools almost touch the edge of the media. If the left spool is adjusted too tightly it causes the media to bunch up on the edge. If the left spool is adjusted too loosely it allows the media to weave while it is being rolled up. To adjust either front or rear spools, hold onto the media core or roll with one hand and rotate the flange of the spool with the other hand.

NOTE

Loading the media without taping it to the media core allows you to slide the completed roll of plots off the take-up core.

21. If the following error message appears on the display,

    Display:

    No paper in path
    please load paper

    Turn off the plotter and repeat the loading procedure beginning with step 19.

22. Press AUTO key and run the plot.

23. When the plot is completed, remove the finished plot by pressing the LOAD/UNLOAD key. The plotter continues feeding media until it senses the end of the plot. The plotter then feeds out an additional 2 inches of media allowing a margin for cutting.

Roll Feed Plot Removal (Model 1044GT)

To remove the finished plot, ensure that the plotter is in Manual Mode and press the LOAD/UNLOAD key. The plot feeds onto the take-up roll. The plotter continues feeding media until it senses the end of the plot. It then feeds an additional 2 inches of media to allow a cutting margin. Use the CalComp-supplied media cutter to slit the media along the scored cutting line on the top surface of the lowered platen.

Remove the finished plot from the take-up core. To continue plotting on roll media, tape the cut edge of the media to the empty take-up core.

To continue plotting on cut sheet media replace the sprocketed drum with the grit drum.

NOTE

When operating a 1044GT plotter in Cut Sheet Mode, pressing the LOAD/UNLOAD key triggers rotation in both the right front and right rear media spool hubs for approximately 10 seconds. This action stops automatically and does not require operator intervention.

Removing Media Roll (1044GT)

To change the media roll or remove an empty roll, follow these instructions:

1. Put plotter in Manual Mode and press LOAD/UNLOAD key.
2. Move plotter to provide access to the rear.
3. Raise the protective cover.
4. Move to the rear of the plotter and where applicable, pull media out of plotter.
5. Where applicable, rewind media on media roll and tape.
6. Grasp media roll with both hands and press to the right against the spring-loaded hub.
7. Lift the left end of the media roll first, then remove the media roll from the right hub.
8. Store media roll in a horizontal position.

Exchanging Sprocketed Drum for Grit Drum (Model 1044GT)

All model 1044GT plotters are shipped with two drums: a grit drum for use with cut sheet media and a sprocketed drum for punched roll media.

Before beginning any plot job, determine what kind of media is required and install the appropriate drum. Exchanging drum types is a simple operation.

As an example, assume the sprocketed drum is already installed on the plotter. To replace it with the grit drum, proceed as follows:

1. Turn the power off, lock the casters, and raise the safety cover. Remove any media on the plotter. Record the scale factor values (See Set-Up 13 in Chapter Six.) for the drum being replaced.

2. Slide the pen turret and carriage to the far right of the carriage beam to prevent damage to the turret during drum removal and replacement.

3. Release the lever on the left pinch roller assembly and slide it to the right until it contacts the pen carriage. This allows easy access to the left edge of the drum.

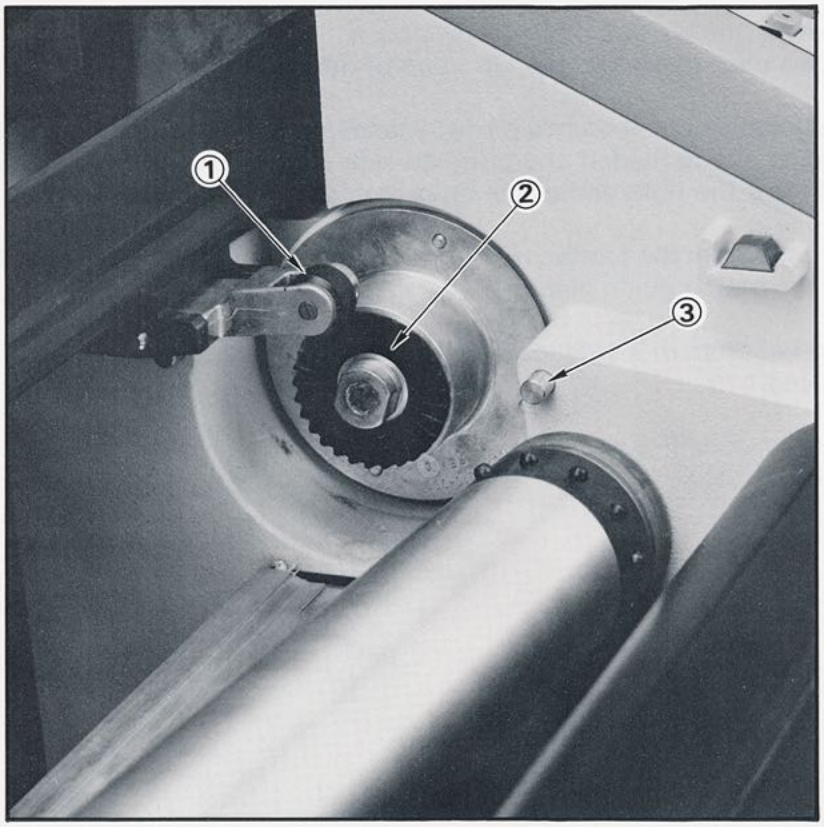
4. Holding the installed sprocket drum with both hands, apply side pressure toward the left end. The left end of the drum is spring loaded and gives as side pressure is applied. This allows the operator to disengage and clear the right end of the drum from its gear mesh socket.

5. To remove the drum from the plotter, move the drum down and pull it forward. Do not strike the turret mechanism or the platen guide pins.

   Lay the sprocketed drum in a safe location. A dented or damaged drum does not work properly and has to be replaced.

   Install the grit drum. See Figure 3-10.

6. Record the scale factor data from the tag on the end of the drum. Notice that the left end of this drum has a bearing. Guide this end onto the shaft in the left drum socket, apply side pressure to the left, and press in. The left spring gives slightly, allowing the right end of the drum to fall into place. Do not strike the turret mechanism or the platen guide pins.



① *Pinch Roller* ② *Drum Coupling Device* ③ *Platen Dowel Pin*

Figure 3-10. Grit Drum Installation (1044GT)

7. Ensure the drum's right-end gear mesh properly with the coupling device for proper drum rotation.
8. When the drum is correctly seated, release the side pressure on the left side of the drum. Rotate the drum several revolutions by hand to ensure complete freedom of movement.
9. Return the pinch roller to the left side of the plotter. Gently lower the pinch roller lever into place.
10. Raise both the rear and front platens and lock them into place over the vacuum columns.
11. Return the pen carriage to the center of the beam and turn power on.
12. Using Set-Up 13 in Chapter Six, enter the scale factor values for the newly installed drum.
13. Using Set-Up 10 in Chapter Six, enter the media type selection.
14. Load the media and proceed with the plot.

Installing Optional Drums (Model 1042GT/1044GT)

For special operations, you may need to use media that is less than 36 inches wide. While the set-up procedures can handle a standard 15-inch roll, it requires that you remove the standard drum and replace it with an optional drum 15.4 inches wide. On the 1044GT narrow media adapter drum, sprockets are in the middle of the drum and to the right side, rather than at either end. On the 1042GT narrow media adapter drum, the left grit band is also in the middle of the drum.

The correct narrow media adapter kit must be ordered for either the 1042GT or the 1044GT. A narrow media adapter kit is not available for the 1043GT.

Procedures for installing this optional drum are similar to the instructions for installation of the conventional drum. Special baffles are required for the 1044GT and special mandrels are required on both the 1042GT and 1044GT models.

See Chapter Eight for a list of all optional drums available. To install optional drums, proceed as follows:

1. Remove the normal grit drum or sprocketed drum by applying pressure in to the left side and lifting the right end of the drum. When the right end is released from the gear teeth, release the pressure on the left end and remove the drum.

2. Place the special baffles in the rear and front vacuum columns as shown in Figure 3-11.

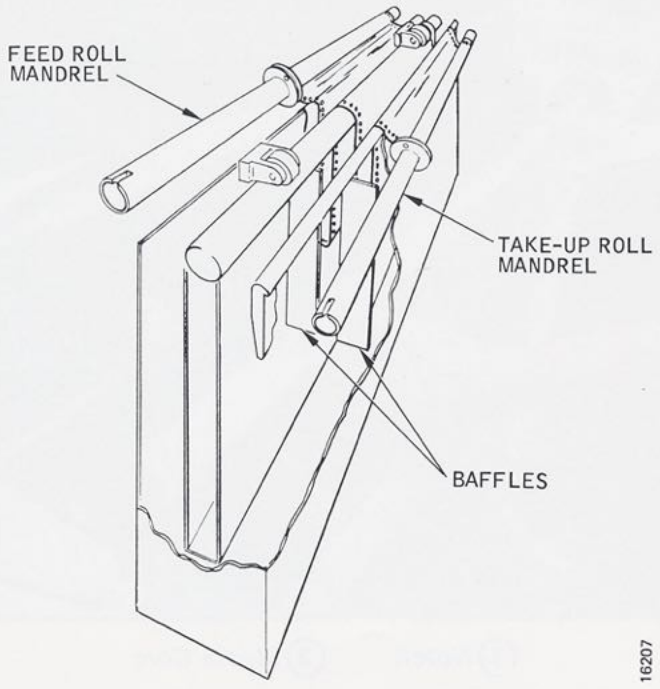


Figure 3-11. Installing Baffles (1044GT)

Ensure the baffles are inserted far enough to the left of the middle sprocket teeth to allow the media to move through the plotter unobstructed.

3. Remove the feed roll and install the narrow media roll onto the rear mandrel.

4. Install the rear mandrel. (See Figure 3-12.) The locking rings on the mandrels adjust for media tracking and should be secured against the left side of the media roll.

5. Insert the left end (the spring-loaded end with the bearing) of the optional drum into the left hub on the plotter.

   Seat the right end (the end with the gear) into the right gear mechanism, ensuring that the gear teeth mesh.

6. Remove the conventional take-up media core and install the front take-up mandrel with the short media core attached.

7. Install the media roll with the leading edge on the bottom for the 1044GT and on the top for the 1042GT. (See Figure 3-12.)

① *Notch* ② *Media Core*

Figure 3-12. Installing Mandrels (1042GT and 1044GT)

Adjust the locking rings to accommodate the media tracking and secure them against the left side of the media roll.

8. Thread media as previously outlined for 36-inch roll media installation.

9. Refer to Select Media Type (Set-Up 10) and change the media type selection to the 15-inch roll option.

LOADING PENS

Four types of plotter pens are used with the 1040GT Series as shown in Figure 3-13. They are plastic tip pens, fiber tip pens, liquid ball pens, disposable liquid ink pens and refillable liquid ink pens.

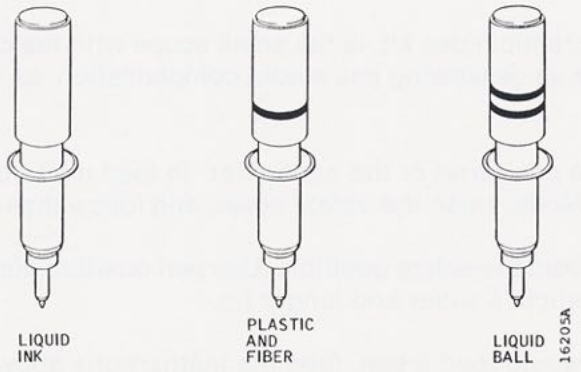


Figure 3-13. Types of Pens

Each pen type has identifying markings on its case: for example, the liquid ink pen does not have a band, the plastic and fiber tip pens have one band, and the liquid ball pen has two bands. Further considerations of pen type and quality are discussed more completely in Chapter Five.

Loading the pens into the pen turret is a simple operation. Follow the instructions below:

1. Select the desired pen type and ink color. Both colors and pen type are clearly marked on the top, sides and protective cover of each pen. The plotter identifies the pen type by the number of bands on the pen body.

2. Remove and save the protective pen tip caps.

3. Remove the pen turret from the plotter. Using thumb and forefinger, place the pen tip into the pen guide opening in the bottom of the turret. The pen tip should rest on one of the pen caps.

4. Ensure each pen has a corresponding pen cap of the correct type. These caps keep the pen tips covered and they must fit snugly to work properly. A liquid ink pen must have a black cap; a plastic/fiber tip or liquid ball pen must have a beige cap.

5. Press the pen into place. When the pen is properly set on the vertical, the spring mechanism clicks.

6. Load up to eight pens in the turret.

7. Remove pens by pressing down gently and sliding the pen free. Replace the cap on each pen removed. Except for the liquid ink pens, store all pens upright so that tips remain primed. Disposable liquid ink pens should be capped and stored in a horizontal position.

8. Note the position of each pen (1 through 8), its color and type in the turret. This information is necessary to know when you are assigning pen positions in your software.

   For additional information on pens, see Chapter Five.

LOADING THE RETICLE

The reticle, included in the premium pen kit, is the small scope with the crosshairs lens. This instrument is useful for such operations as deskewing and media compensation, as well as establishing new points of origin.

Load the reticle in either the pen turret or the penholder. To load it into the turret (see Figure 3-14), place the plotter in Manual Mode, raise the safety cover, and follow these steps:

1. Remove the rubber cap from the select position. (Use pen position number one for this purpose.) This provides space for the reticle's wider and longer tip.

2. Load the reticle as you would load a pen. (See the instructions above for loading a pen.)

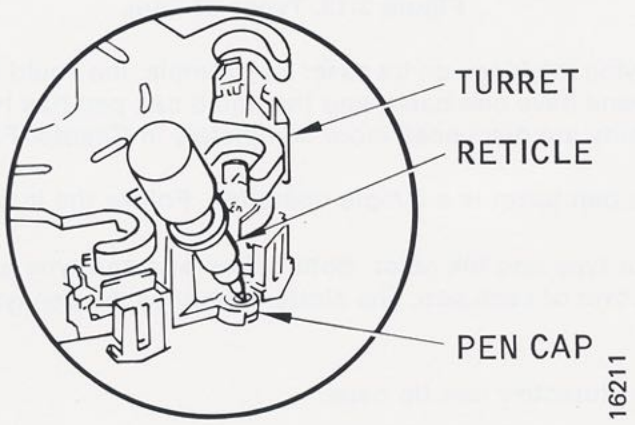


Figure 3-14. Loading the Reticle

To load the reticle directly into the penholder, place the plotter in Manual Mode, raise the safety cover, and follow these steps:

1. Remove the pen turret from the plotter.
2. Insert the reticle directly into the penholder. See Figure 3-15.
3. After using the reticle, remove it and replace the pen turret.
4. Lower safety cover.

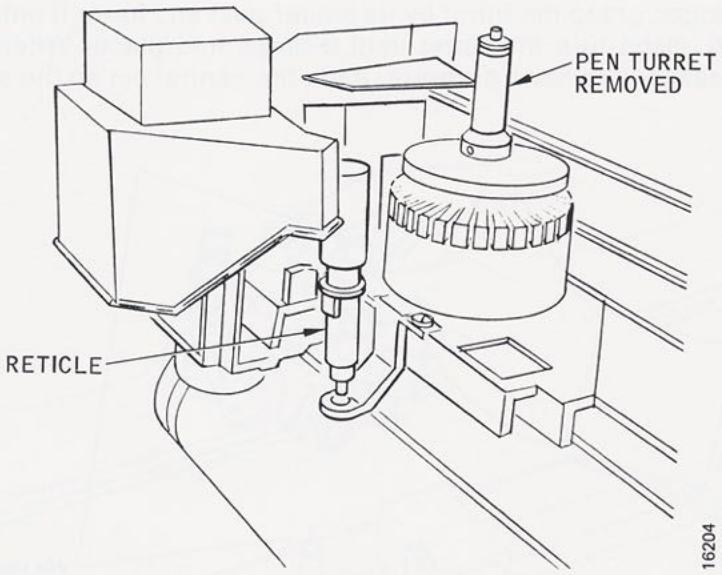


Figure 3-15. Reticle in the Penholder

PEN TURRET INSTALLATION

After the turret is loaded with selected pens, turn the power on and follow these instructions:

1. Raise the safety cover.

   Display:

   Install Turret
   RESET when corrected.

2. With thumb and forefinger, grasp the turret by its center post and lower it onto the center spindle as shown in Figure 3-16. Hand turn the turret until it drops into place. When the turret is properly engaged, it does not respond to hand pressure. Also, the central pin on the spindle is flush with the top of the turret.

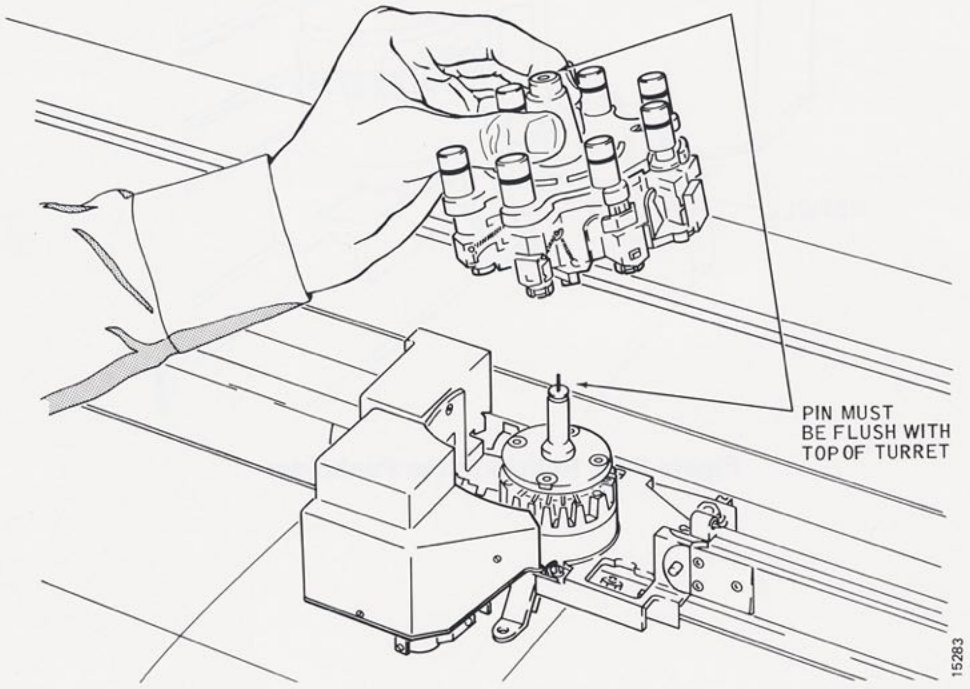


Figure 3-16. Installing the Turret

3. Lower the safety cover. Press the RESET key. The pen turret rotates to locate pen position one and all other pen locations. Depending on whether the media has been previously loaded or not, one of the following messages appears:

   Display:

Ready Press AUTO to Plot	OR	Position Carriage & Load Paper Please	(Use the keyboard controls or joystick to manually position the carriage a minimum of 5 inches from the right side support. This allows correct carriage sensor position response during the automatic load routine.)

4. Remain in Manual Mode to establish certain set-up or test functions.

   Press the AUTO key if the plotter is set up and ready to accept plotting information from the host.

5. To remove the turret, lift it off the spindle.

QUESTIONS AND ANSWERS

Does the plotter know how many pens are installed?

Yes. During turret initialization, a pen sensor counts the number of pens loaded in the turret and stores this information in memory for use during the present plotting session.

How do you know when the turret is seated properly?

The turret fits snugly onto the turret spindle with the central pin just flush with the top of the turret. If this doesn't happen, try revolving the turret slightly and pressing down with a very light force. The turret should then settle in completely.

Can you run the plotter without the turret?

Yes, if there is a pen in the penholder.

When would it be helpful to change the acceleration value?

In a complex calculation where many short vectors must be plotted and throughput is limited by the computer rather than the plotter, it may prove useful to slow the plotter's acceleration rate down in order to make uniform lines.

Can you use more than one kind of pen on a drawing?

Yes. The 1040GT plotters can use and recognize any combination of pen types in the same turret. Pen-type information is collected when a pen is selected from the turret. At this point, the vertical movement causes the pen sleeve to pass a sensor and count the pen bands. The plotter then retrieves pen parameter information from memory for use while the pen is selected. However, not all the pen types can be used with all the media types. Refer to Chapter Four for information on pen/media compatibility.

How long can pens remain in the turret without drying out?

Do not let pens sit for extended periods of time in turret or pen block between plot jobs. Remove pens and insert into pen humidifier. The pen humidifier provides humidification for keeping pens ready for instant start-up between extended non-plotting periods.

Fiber tip and plastic tip pens in the turret last up to 30 days if the proper pen caps are installed. However, if you are not planning to use a pen for several days, it is recommended that you remove the pens from the turret and store them with their protective pen caps on tightly.

How can media loading and tracking problems be avoided?

Cut sheet media loading onto a 1040 Series plotter is simple and easy to accomplish. The following information on pinch rollers and media is helpful in understanding loading techniques. Loading or tracking problems can be corrected by realignment, media replacement or following special loading considerations.

Pinch Roller Misalignment

The right pinch roller never needs to be moved and is always located over the right grit ring. The left frame of the right pinch roller is directly over the gap between the drum and the left edge of the grit band with the rubber roller riding completely on the grit ring when the assembly is in correct alignment. Realignment of the right pinch roller must be accomplished by a qualified service representative.

The left pinch roller is repositioned by the operator to compensate for varying media widths and different size drums. It is important that the pinch roller assembly be positioned either completely on the grit ring or completely off the grit ring. The pinch roller assembly cannot straddle the gap between the drum and the grit ring for successful loading and media tracking operation. The normal position of the left pinch roller is close to the left edge of the media while meeting the above placement conditions.

Mishandled Media

Media should always be allowed to acclimate to the surrounding environment prior to being used. Media that is rolled, wrinkled or folded causes loading and tracking problems and should be avoided.

Media, when loaded, retains whatever track pattern that is initially embedded into it by the pinch rollers. This is especially true of Vellum 1411, translucent and gloss. Therefore, if you try to reuse media, it tends to migrate toward the original track pattern.

Media that is not square, is an irregular size or has a wavy edge needs to be handled and loaded with care to ensure that it loads and tracks without skewing.

Special Loading Considerations

If tracking problems are observed after following a normal loading procedure, check the following:

- Ensure that the front and rear platens are fully seated.
- Ensure that the right edge of the media is on the load line and that the right pinch roller is to the left of the right media edge.
- Observe the lay of the media as it is draped over the drum and platens. It should lay flat and square with no wrinkles.
- Ensure that the left pinch roller is either completely on or completely off the left grit ring. Ensure that you are using the correct size drum for the media being used.

CHAPTER FOUR
SELECTING MEDIA

PLOTTING MEDIA

Introduction

The 1040GT Series plotter is a sophisticated, high performance machine. It requires the right combination of media, ink and pens to produce the best results. For example, using a plastic tip pen on polyester film results in a smudged, inaccurate plot. Plotting on polyester film requires a liquid ink tungsten tip pen. The plotting application you select determines the types of media and pens you use.

All 1040GT plotters are designed for use with CalComp specified media, pen and ink. Use of other vendor's accessories is not recommended as they may not work as well as those products designed and supplied specifically for the CalComp 1040GT plotters.

Creating a Plot

Selection of pens, inks and drafting media should be based on the ultimate use of the drawing. Consider, for example, the requirements for color, line quality, length of storage, medium stability, cost and reproduction before deciding on which media and pens to use.

To generate a check plot or working drawing that is used briefly and then discarded, the plot probably serves just as well if it is drawn on an inexpensive paper, such as translucent, using convenient liquid ball, plastic or fiber tip pens.

If you require a final drawing for an architectural design — a plot that is reproduced any number of times, reduced or stored, then a more expensive medium, such as vellum should be used in conjunction with disposable or drafting (refillable) liquid ink pens.

You might even need to produce a drawing, such as an integrated circuit design, that not only requires a considerable length of storage time, but must be reproduced (for bluelines) down to the smallest detail, able to record a large number of lines drawn very close together, and be capable of producing transparencies and overlays. For these purposes, plots should be drawn on polyester film using tungsten tip liquid ink pens.

Several factors, therefore, relate to the pen and media selection:

- The need for a very intricate drawing involving many lines or many colors
- The speed at which the plot can be drawn
- The requirements for diazo or other copying
- The storage life of the document
- The potential wear to the pen tips

On the following pages, are detailed descriptions of media and pens available, what their various qualities and shortcomings are, and how to maintain them.

CalComp Recommended Media

The 1040GT Series plotter is designed to be used with seven distinct kinds of media. These are:

- Translucent
- 22-Pound Bond
- 100 Percent Rag
- Vellum E
- Vellum 1411
- Polyester Film
- ClearPlot® Film

These types of drafting media may be obtained directly from CalComp. Each of these media possesses different characteristics as described below. To select the proper media, refer to Table 4-1. This table rates each media type according to specific media characteristics and applications.

MEDIA TYPES

Translucent

Translucent, often called lightweight 15-pound bond, is both economical and easy to use. Treated for translucency, this paper is suitable for good blueline reproduction as well as conventional photocopying.

22-Pound Bond

For preliminary drawings and check plots, 22-pound bond is an economical paper. Because of its opaqueness and high contrast, 22-pound bond is excellent for photo reproductions.

100 Percent Rag

This paper is 100 percent cotton fiber paper. Because of its cotton fiber, this paper is superior to translucent and bond paper because it is stronger, longer lasting and more opaque. The excellent contrast and opacity of rag paper gives it superior photo reproductive qualities.

In addition, 100 percent rag is recommended for archival storage. Cotton, when stored under optimal conditions, can be retained for centuries.

Rag is more expensive than wood pulp bonds, but less expensive than vellum.

Vellum 1411

CalComp Vellum 1411 is a resin-impregnated vellum specially designed to have the best combination of stability, translucency and ink acceptance. Because of its high translucency, Vellum 1411 provides excellent blueline reproductions. However, since resin-treated vellums tend to crease on folding, exercise care when handling the finished plot.

Vellum E

Vellum E is made of 100 percent cotton and is designed for general plotter use where the ultimate in transparency is not required. It provides good blueline reproductions. This vellum generally doesn't show creasing at the fold and doesn't require the special handling of Vellum 1411.

Polyester Film

CalComp matte polyester film possesses a very high dimensional stability despite changes in temperature and humidity. For this reason, this film is recommended for close tolerance and high accuracy applications, such as overlays and master copies. It has excellent translucency and does not tear, crack, peel or fade under normal use.

Fingerprints on the surface may interfere with the ink adhesion, so polyester film must be handled carefully before it is used. Ink must be allowed to dry on film through evaporation rather than absorption. For this reason, refillable liquid ink pens are best suited for drawing on polyester film and produce a distinct, continuous line with virtually no beading, bleeding or feathering. Therefore, polyester film renders quality reproductions that are sharp and clear.

ClearPlot® Film

ClearPlot® , a transparent plastic material, is used for creating excellent overhead transparencies of the sort used for business graphics and presentations. It is available as a standard product from CalComp.

MEDIA CHARACTERISTICS

When selecting media, it is important to consider how the finished plot is to be used. Below is a list of qualities to look for when choosing the medium you need.

Stability

Stability is the medium's resistance to dimensional change. Both ambient temperature and humidity can affect a medium's stability. Most affected by humidity are the fiber-based media such as translucent, 22-pound bond, rag and vellums. Polyester film is less vulnerable to changes in humidity and changes in temperature.

Dimensional changes are significantly less within the normal operating range of 65 to 75 degrees Fahrenheit and 40 to 60 percent humidity. Within these ranges, less than 1 percent dimensional change can be expected in paper and vellums.

Storage Life/Permanence

Storage life/permanence is the length of time a medium is stored, prior to and after plotting, before it begins to degrade. For long-term storage (archival), polyester film is best; 100 percent rag is the best kind of paper for storage.

Translucency

Translucency is the measure of a medium's ability to pass light. This characteristic, along with other factors such as line density, directly affects the quality of the blueline copies made from the original. Vellum 1411 is best for this application.

Contrast

Contrast is the differences in image density between the lines drawn and the medium itself. This affects the quality of both the original and any photo reproduction made from the original. The best medium for this application is 100 percent rag and 22-pound bond.

Resistance to Wrinkling and Folding

Resistance to wrinkling and folding is the ease with which a material may be handled without producing visible fractures or folds. Polyester film and Vellum 1411 have the least resistance, while 100 percent rag and 22-pound bond have the greatest resistance. Consider this characteristic if the finished plot must be handled and used by many people.

Inking/Line Quality

Inking/line quality is the ability of the media to accept ink for high contrast, line clarity and ink adherence. For best results, use polyester film or Vellum 1411.

Economy

Economy is the cost of the media. Translucent paper is the most economical for check plotting and everyday use. Polyester film and Vellum 1411 are the most expensive and are generally used for final plots.

MEDIA CHARACTERISTICS GUIDE

Below is a chart rating media according to their material characteristics.

TABLE 4-1. MEDIA CHARACTERISTICS

Characteristics	Recommended 1	2	3	Least Recommended 4
Stability	Polyester Film		Vellum E and 1411	100% Rag
Folding	100% Rag 22# Bond Translucent	Vellum E		Polyester Film Vellum 1411
Inking/Line Quality	Polyester Film Vellum 1411	Vellum E 100% Rag	22# Bond Translucent	
Contrast	Vellum E 100% Rag 22# Bond	Translucent	Vellum 1411	Polyester Film
Translucency	Polyester Film	Vellum 1411	Translucent	
Transparency	ClearPlot®	Polyester Film		
Economical	Translucent	100% Rag 22# Bond	Vellum E and 1411	Polyester Film
Blueline Drawings	Polyester Film	Vellum 1411	Translucent	
Photo Reproduction	100% Rag Vellum E	22# Bond	Translucent	
Archival	Polyester Film	100% Rag		

MEDIA APPLICATIONS GUIDE

The chart below shows which plotter uses what types of media. A brief description of each media type is also provided. See Table 8-3 in Chapter Eight for additional detail.

TABLE 4-2. MEDIA APPLICATIONS GUIDE

PLOTTER	SERIES	DESCRIPTION
1042 1042GT	900-37	36.7 in/932 mm nonpunched rolls perforated for 34 in/864 mm plots. Available in translucent, vellum 1411 and polyester film.*
	900-15	15.4 in/391 mm nonpunched rolls perforated for 11 in/279 mm plots. Available in translucent, vellum 1411 and polyester film.*
	900-15M	15.4 in/391 mm nonpunched rolls perforated for 11.7 in/297 mm ISO standard plots. Available in translucent, vellum 1411 and polyester film.*
1044 1044GT	500	36.7 in/932 mm punched rolls perforated for 34 in/864 mm plots, for continuous plotting. Available in translucent, 22# bond, 100% rag, vellum E, vellum 1411, polyester film and ClearPlot®.
	600	15.4 in/391 mm punched rolls perforated for 11 in/279 mm plots, for continuous plotting. Available in translucent, 100% rag, vellum E, vellum 1411 and polyester film.
1042 1042GT 1043 1043GT 1044 1044GT	**PERFORATED SHEETS**	
	E600-P 22# Bond E300-P Vellum 1411	36 in × 44 in/914 mm × 1118 mm sheets perforated for 34 in/864 mm plots.
	D600-P 22# Bond D200-P Translucent D300-P Vellum 1411	25 in × 34 in/635 mm × 864 mm sheets perforated for 22 in/559 mm plots.
	NONPERFORATED SHEETS	
	Refer to Pages 3 and 4 of the CalComp 1020 and 1040 Series Pen Plotters Graphic Supplies Guide for nonperforated cut sheet offering	

MEDIA SIZE AND COMPATIBILITY GUIDE

The chart below shows which media can be used with each type of CalComp 1040GT plotter and what type of drum must be used in conjunction with the plotter and media.

TABLE 4-3. MEDIA/DRUM CROSS-REFERENCE

	GRIT DRUMS									SPROCKETED DRUMS	
Drum Number	22	23.4	24	28	30	33	34	36	15	36S	15S
Media Width	22	23.4	24	28	30	33.1	34	36	15.4	36.7	15.4
1042G	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	Opt.	N/A	N/A
1043GT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	N/A	N/A	N/A
1044GT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	N/A	Std.	Opt.

Domestic Cut Sheet Sizes	
ANSI Engineering	**Architectural**
A Size = 8.5 x 11 inch	9 x 12
B Size = 11 x 17 inch	12 x 18
C Size = 17 x 22 inch	18 x 24
D Size = 22 x 34 inch	24 x 36
E Size = 34 x 44 inch	36 x 48
F Size = 28 x 40 inch	30 x 42

International Cut Sheet Sizes
ISO
A4 Size = 210 x 297 mm
A3 Size = 297 x 420 mm
A2 Size = 420 x 594 mm
A1 Size = 594 x 841 mm
A0 Size = 841 x 1189 mm

HUMIDITY AND YOUR PLOTTING MEDIA

CalComp plotters perform satisfactorily in a relative humidity range from 40 to 60 percent. However, plotter performance may be affected considerably by plotting materials that have experienced dimensional changes caused by absorption or desorption of moisture from the surrounding air. This situation occurs frequently if the plotter's environment is not maintained within the recommended humidity range of 40 to 60 percent relative humidity (RH).

Cellulose-based material, such as translucent, bond paper, rag, and vellums exhibit dimensional changes with variations in relative humidity. Temperature change usually causes only very minor changes to occur (on the order of I percent change for 40 to 60 percent RH and 65 to 75 degrees Fahrenheit).

Polyester film has a much greater stability range than paper. Film shows very little dimensional change over wide swings in humidity. In areas where humidity levels exceed the prescribed range, CalComp recommends the use of polyester film for precise plots.

If you store your media in a different location than the plotter, always keep a limited number of rolls or sheets near the plotter. These media should be removed from their carton and cellophane wrapping to allow them to acclimate. Media should always be exposed to the same environment as the plotter for at least 48 hours before use. This exposure allows the media to adjust to the humidity of its surroundings. This should help eliminate various media tracking problems and minimize drawing inaccuracies.

QUESTIONS AND ANSWERS

Does media track properly on drum?

Tracking is the movement of the plotting medium on the plotting drum. Problems occur from a misalignment of punched holes on the plotting medium, from uneven winding of the media from the feed roll through to the take-up reel, or from a misalignment of cut sheet media on the drum at the beginning of the plot.

Any of these tracking situations can result from improper mechanical function, but others can be fixed by the operator.

Frequently, the media you're using becomes warped. This causes the plotter to track incorrectly. You can usually avoid this warping by keeping the plotter environment at a constant temperature and humidity within the desired range for plotter operation (40 to 60 percent humidity and 65 to 75 degrees Fahrenheit). Purchase a hygroscope and place it near the plotter to keep track of the humidity. Sometimes the problem is created by inaccurately punched media. Avoid this problem by only using CalComp-approved punched media on your sprocketed drums.

Does pen seem to be wearing out too quickly?

Some media prove very abrasive and wear down a pen tip very quickly. An example of an abrasive plot medium is polyester film that has an overlay of matte finish allowing the ink to adhere to the film's surface. Because of the abrasiveness of matte surfaces many kinds of pen tips, specifically fiber, plastic and steel tip pens wear down quickly if used in conjunction with such plot medium.

To avoid this problem, do one of two things:

- Change the medium to a soft surface, such as, Vellum E, 22-pound bond, or 100 percent rag.
- Change the pen to a tungsten tip pen that wears longer on abrasive surfaces.

Can you use the plotter and media when the humidity or temperature exceeds the recommended limits?

The plotter continues to function both above and below the recommended limits. However, both humidity and temperature limits should be observed to draw accurate plots. Where precision is required, use within the recommended limits.

How can you be sure the media tracks before you start the plot?

Media that are left loaded onto the plotter can gain or lose moisture causing it to track differently than new media being pulled off the roll. Media tracking can be checked by using the manual controls to run an additional five feet of plot medium onto the take-up roll. Run the media roll back and forth through the plotter several times observing tracking conditions. There should be no wave or looseness on the right or left side of the plot medium where it is being rolled up or fed off the roll.

CHAPTER FIVE
SELECTING PENS AND INK

PENS AND INKS

Introduction

There are a variety of pens available for use on the 1040GT plotters. Some pens can be used on any media selected; others are designed to give the very highest quality results for particular types of media. This section discusses which pens are best suited to your needs.

If you select either the disposable liquid ink or the refillable liquid ink pens (often called drafting pens), you must also choose an appropriate ink. There are many colors and kinds of ink you may use on the 1040GT plotters, but once again, some inks work better with certain media than others. This chapter discusses ink selection and Table 5-2 lists correct media/pen combinations.

Finally, this chapter describes the best way to clean and maintain refillable liquid ink pens. Follow these instructions if you use these types of pens.

PEN SELECTION

Introduction

Give careful consideration to matching the pen to the media on which it plots. Different pens produce different plot qualities and require varying amounts of maintenance.

The plotter can operate with four types of pens: fiber tip, plastic tip, liquid ball and liquid ink (both disposable and refillable). With the exception of the disposable and refillable liquid ink pens, all other 1040GT plotter pens have bands on their pen bodies. Sensors located in the pen carriage assembly detect these bands to identify the pen type. This enables the plotter to automatically control pen parameters such as pen force and velocity.

Table 5-1 lists the types of pens available.

TABLE 5-1. PEN GUIDE CHART

PEN CHARACTERISTICS	PEN TYPE/ APPROX. LINE WIDTH	RECOMMENDED MEDIA
Disposable Inexpensive Dense line Good reproduction quality	WLB Liquid Ball MED. 0 12 in/.3 mm	Translucent Gloss 100% Rag 22# Bond
Disposable Medium lines Vivid colors Excellent business graphics	WPP Plastic Tip MED. 0 12 in/.3 mm	ClearPlot® Translucent 22# Bond Gloss
Disposable Broad lines Vivid colors Excellent business graphics	WFP Fiber Tip BRD 0.025 in/.64 mm	ClearPlot® Translucent Gloss 22# Bond
Disposable Convenience Economical Excellent reproduction paper/ vellum only Stainless steel tip No maintenance	WL Disposable Liquid Ink Ex Fine 0.010 in/.25 mm Fine 0.014 in/.35 mm Medium 0.020 in/.50 mm Broad 0.028 in/.70 mm	Translucent Vellum 1411 Vellum E 100% Rag 22# Bond
Disposable Excellent reproduction No maintenance	WT Disposable Liquid Ink Ex Fine 0.010 in/.25 mm Fine 0.014 in/.35 mm Medium 0.020 in/.50 mm Broad 0.028 in/.70 mm	Polyester Film
Reusable General plotting Good blueline and photo reproduction	LI Liquid Ink Pen Tips 7L Stainless Avail. in 6 line widths	Translucent 100% Rag Vellum E Vellum 1411 22# Bond
Reusable Durable High quality for final plotting Excellent blueline and photo reproduction Long life	LI Liquid Ink Pen Tips 7T Tungsten Avail. in 6 line widths	Polyester Film

Point Designation	7L/7T TIP SIZE					
	2 (00)	3 (0)	4 (1)	5 (2)	6 (2½)	8 (3)
Approximate Line Width: 7L-Stainless Steel 7T-Tungsten	0.010 in 0.25 mm	0.011 in 0.28 mm	0.015 in 0.38 mm	0.018 in 0.46 mm	0.022 in 0.56 mm	0.027 in 0.69 mm

Pen Descriptions

FIBER TIP (WFP)

The fiber tip pen is a broad point pen (approximately 0.025 inch) capable of producing vivid colors. Its broad point and sharp line edges make the fiber tip pen a natural choice for business graphics with entire areas of solid color.

These pens are available in black, blue, red, green, brown, orange, purple and magenta. The WFP pens are inexpensive, disposable, and can be used with all media types except polyester film. Many customers prefer the broader line drawn by the WFP for shading or drawing borders.

Fiber tips are recommended for use on translucent, gloss, 22-pound bond and ClearPlot® .

PLASTIC TIP (WPP)

The plastic tip pens are capable of producing a much finer line (approximately 0.013 inch) than the fiber tip pens, yet they have the same bright colors and are excellent for graphics on paper and overhead transparencies. They come in the same eight colors as the fiber tip pens.

Plastic tip pens are recommended for use on translucent, 22-pound bond and ClearPlot® .

LIQUID BALL PEN (WLB)

The liquid ball pens are self-contained and produce a dense line at maximum plotter speed. These pens provide a line width between 0.011 and 0.013 inch (approximately) and are available in black, red, blue, green, brown, orange, purple and magenta.

These pens are recommended for use on translucent, 22-pound bond, film and 100 percent rag.

DISPOSABLE LIQUID INK (WL — Stainless Steel Tip)

Disposable liquid ink pens are an excellent choice to achieve results approaching conventional liquid ink pens without the requisite filling and cleaning required by refillable liquid ink pens. These pens are available in four line widths: 0.010 inch (extra fine), 0.014 inch (fine) and 0.020 inch (medium) 0.028 inch (broad). These pens provide excellent reproductions and are available in four colors: blue, green, red and black.

These pens are recommended for use on translucent, 100 percent rag, 22-pound bond, Vellum E and Vellum 1411.

DISPOSABLE LIQUID INK (WT — Tungsten Tip)

Disposable liquid ink pens are an excellent choice to achieve results approaching conventional liquid ink pens without the requisite filling and cleaning required by refillable liquid ink pens. These pens are available in four line widths: 0.010 inch (extra fine), 0.014 inch (fine), 0.020 inch (medium) and 0.028 inch (broad). These pens provide excellent reproductions and are available in four colors: blue, green, red and black only.

These pens are recommended for use on polyester film only.

REFILLABLE LIQUID INK

Properly maintained, the liquid ink pens provide the ultimate in line density and contrast. CalComp has a wide range of liquid ink pen tips in various types and sizes. Specific line width requirements are met by combining the appropriate pen tip size with the proper plotting speed for the desired result. Pen line width options range from approximately 0.010 to 0.027 inch.

The pen tip types offered are 7L series (stainless steel) and 7T series (tungsten). Each pen tip type has its own special features.

7L Stainless Steel Liquid Ink Pens are the most economical liquid ink pen. They produce high-quality lines and plots to be used for blueline or photographic reproductions. These pens are recommended for use on CalComp translucent, 22-pound bond, 100 percent rag, Vellum E, and Vellum 1411.

7T Tungsten Liquid Ink Pens create the same lines and images as the stainless steel. However, since the tip is made from tungsten, it is recommended for use on abrasive surfaces such as polyester film.

Recommended Media/Pen Combinations

Below is a table listing combinations of pen and media that produce the best quality for each plot.

TABLE 5-2. MEDIA/PEN COMBINATIONS

PEN TYPE	PEN CHARACTERISTICS	SUGGESTED MEDIA	VELOCITY		PEN FORCE			PEN CAPPING
			DEFAULT	MAX	ACCEL	DEFAULT	MAX	
WLB – Liquid Ball	• Disposable • Inexpensive • Dense line • Good reproduction quality	• Translucent • Gloss • Rag • 22# Bond	24 ips/ 609 mmps	24 ips/ 609 mmps	1.2	08	10	Yes
WPP – Plastic Tip	• Disposable • Medium lines • Vivid colors • Excellent business graphics	• ClearPlot® • 22# Bond • Gloss • Translucent	6 ips/ 152 mmps	14 ips/ 356 mmps	1.2	03	05	Yes
WFP – Fiber Tip	• Disposable • Broad lines • Vivid colors • Excellent business graphics	• ClearPlot® • Translucent • Gloss • 22# Bond	6 ips/ 152 mmps	14 ips/ 356 mmps	1.2	03	05	Yes
WL – Disposable Liquid Ink **WL2** – Ex Fine **WL3** – Fine **WL4** – Medium **WL5** – Broad	• Disposable • Economical • Excellent reproduction paper/ vellum only • Stainless steel tip	• Translucent • Vellum 1411 • Vellum E • Rag • 22# Bond	8 ips/ 230 mmps	14 ips/ 356 mmps	1.2	02	04	Yes
WT – Disposable Liquid Ink **WT2** – Ex Fine **WT3** – Fine **WT4** – Medium **WT5** – Broad	• Disposable • Excellent reproduction • No maintenance	• Polyester Film	8 ips/ 230 mmps	14 ips/ 356 mmps	1.2	02	04	Yes
LI – Liquid Ink Pens – 7L Stainless	• Reusable • General Plotting • Good blueline and photo reproduction	• Translucent • Rag • Vellum E • Vellum 1411 • 22# Bond	8 ips/ 230 mmps	14 ips/ 356 mmps	1.2	02	04	Yes
– 7T Tungsten	• Reusable • Durable • High quality for final plotting • Excellent blueline and photo reproduction • Long life	• Polyester Film	8 ips/ 230 mmps	14 ips/ 356 mmps	1.2	02	04	Yes

INK SELECTION

Introduction

If you have selected one of the refillable liquid ink pens (either stainless steel or the tungsten pen), you must choose the ink carefully. Each ink possesses its own properties and reacts with the medium in slightly different ways.

One of the most important factors that determine an ink's properties is its base. Inks are either pigment- or dye-based. Pigment-based inks are actually a suspension of particles in a carrier fluid (usually water). Pigmented inks work by leaving these particles on the medium after the carrier has evaporated. For this reason, pigmented inks yield denser lines, make superior bluelines, and render better photocopies.

Dye-based inks are actually colored solutions rather than suspensions of particles. These inks work by staining the plotting medium. Since they are solutions, dye-based inks possess excellent flow characteristics, but do not have the opacity or line density of pigmented inks. Dye-based inks are not recommended for plots from which blueline copies are made.

Ink Descriptions

Three types of ink are available for the 1040GT plotter liquid ink pens: GP, IGP and ZIP.

GENERAL PURPOSE (GP)

General Purpose ink is a pigmented ink developed to meet most daily needs. GP ink is ideal for blueline and photographic reproductions, yet still offers good flow characteristics for higher speeds. It is recommended for use with all plotting media and CalComp plotters and is available in black, blue, red, brown and green.

IMPROVED GENERAL PURPOSE (IGP)

Improved General Purpose black is a pigmented black ink that is ideal for blueline and photo reproductions. Use IGP on all CalComp media. This ink is fast drying, waterproof, and has excellent permanence.

HIGH SPEED (ZIP)

Zip is high-speed ink designed for plotters with high drawing speeds. It is dye-based for use on translucent and bond media. Use it for check plotting. Zip has a medium drying time but is not waterproof. It is available in black, blue, red, green and brown.

Liquid Ink Characteristics and Selection Guideline

Selecting the right liquid ink is as important as using the right media. CalComp inks are especially formulated for specific user applications. Matching the proper ink with the right plot media assures optimum finished plot quality, for either long-term storage or immediate use.

Table 5-3 is a guideline for the selection of pen plotter ink using a particular plotting media.

TABLE 5-3. LIQUID INK CHARACTERISTICS

INK TYPE	PLOT MEDIA	ARCHIVAL	PIGMENT (HIGH DENSITY)	DYE BASE	BLACKNESS OF LINE	DRYING TIME	ERASABILITY	CHARACTERISTICS
FB-1 — (For film) • Black	• Polyester film	Yes	Yes	No	98%	Fast	Good	• Excellent blueline drawings • Black dense lines on polyester film • Excellent permanence • Not recommended for capping • Fast drying
IGP — (Improved General Purpose) • Black	• Polyester film • Vellum 1411 & E • Bond • Translucent	Yes	Yes	No	94%	Fast	Good	• Excellent blueline and photo reproductions • Excellent permanence
GP — (General Purpose) • Black • Blue • Red • Green	• Polyester film • Vellum 1411 & E • Bond • Translucent	Yes (Black only)	Yes	No	92%	Medium	Good	• Excellent final plots
Zip — (Dye-Based Ink) • Black • Blue • Red • Green	• Translucent • Bond	No	No	Yes	88%	Medium	No	• Check plotting • High-speed plotters
LP — (Liquid Pencil) • Black	• Vellum 1411 • Polyester film	Yes	—	No	—	Medium/ Fast	Good	• Excellent bluelines • Excellent permanence • Excellent elasticity

Note: The results indicated above are considered only as reference points from which initial selection can be made.

REFILLABLE LIQUID INK PENS

Introduction

Careful cleaning, storing and filling of the refillable liquid ink pens are the most important factors in creating good drawings. When a pen cannot draw ink correctly, it does not work well. Pens must be spotlessly clean, both the ink reservoir and the pen tip, or the plotting results are disappointing.

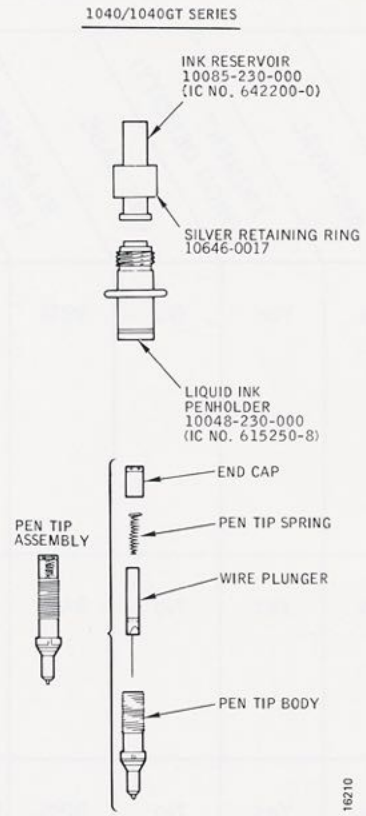


Figure 5-1. Liquid Ink Pen Assembly Parts

As shown in Figure 5-1, refillable liquid ink pens consist of a wire plunger connected to the pen tip body. Ink is fed to the pen body by a refillable ink reservoir that connects to the opposite end of the pen body by means of a clamp ring.

Assembling Liquid Ink Pens

Liquid ink pens come unassembled, in two parts:

- The ink reservoir and penholder
- The pen tip assembly

To assemble the pens for use, follow these instructions:

1. Unscrew the silver retaining ring from the pen body.
2. Remove the plastic ink reservoir.
3. Select the appropriate pen tip assembly.
4. Screw the desired pen tip assembly into the penholder. Use the CalComp concentricity wrench (I.C. No. 657350-5) to tighten (finger tight only).

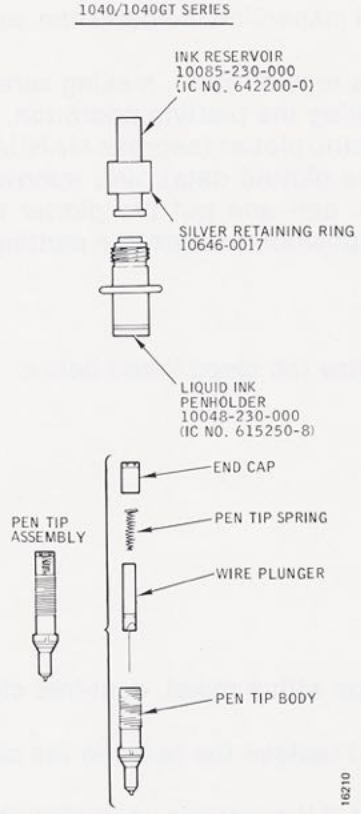


Figure 5-2. Installing Pen Tip

5. Holding the reservoir upside down, fill it to the fill line with ink.
6. While still holding the full reservoir in one hand, gently press the inverted penholder into the open end of the ink reservoir.
7. Slip the silver retaining ring up the ink reservoir and engage the threads of the silver ring onto the threads of the penholder body using the thumb and forefinger of your other hand. Tighten the ring gently but securely to the body.

NOTE

The retaining nut is the silver reflector ring. Take extra care not to scratch or leave ink smudges on the ring. The plotter senses the silver ring to set to the optimum performance parameters for liquid ink plotting, i.e., pen force, velocity and acceleration.

8. Once assembled, point the pen tip down. Hold the pen pointed down for a few minutes, especially if the pen is new. This allows time for the ink to begin filling the plotter point. It may help to gently tap the point near the pen body to dislodge air bubbles, however, do not shake the pen. While handling, hold the pen by the silver retaining ring.

9. Prime the pen by drawing a line on a spare piece of paper or other medium. When the pen begins to write, place it immediately into the pen turret.

10. Ensure the rubber pen cap on which the pen tip rests in the turret is clean. Clean the caps in the turret twice a day with heavy usage, or once a day with moderate usage.

    - To clean, use lukewarm tap water. **Do not use an ultrasonic cleaner to clean the caps.**
    - Replace cap when close visual inspection indicates the surface of the cap is worn or damaged.

Clean the refillable liquid ink pens on a regular basis, making sure all parts of the pen, and particularly the vent hole, are free of dried ink. During the plotting operation, inspect the pen for ink, lint and dust buildup on the pen point. If necessary, stop plotter (depress MANUAL/AUTO button), move the pen to the right side of the plotter (away from the plotted data), and remove pen assembly. Wipe the tip with a moistened, lint-free cloth, replace the pen and put the plotter back in Auto mode. The plotter will automatically return to the last plotted position and resume plotting without loss of origin.

CLEANING THE PEN TIP ASSEMBLY

To clean the pen tips periodically, follow the steps listed below.

1. Press the AUTO/MANUAL button.

2. Press the PEN SELECT key.

3. Press the 0 key.

4. Remove the pen turret.

5. Take out the pens and wipe the tips with a moist, dust-free cloth.

6. Reinstall the pens in the turret and replace the turret in the plotter.

7. Press PEN SELECT and the number of the last pen used. (See the Pen Select routine in the Set-Up section of Chapter Six.)

8. Press the AUTO/MANUAL key. The plotter returns to the last plotted position and resumes plotting.

At the end of the day, remove the pens from the turret for cleaning. Fill one cup with lukewarm tap water and a second cup with cleaner.

Use the method described below to clean the pens and their associated parts. If possible, work at a sink with running tap water.

CLEANING THE PENHOLDER ASSEMBLY

To disassemble and clean the penholder assembly:

1. Unscrew the reservoir retaining ring, then with the pen tip upright, pull the ink reservoir off the penholder body. Refer to Figure 5-3.

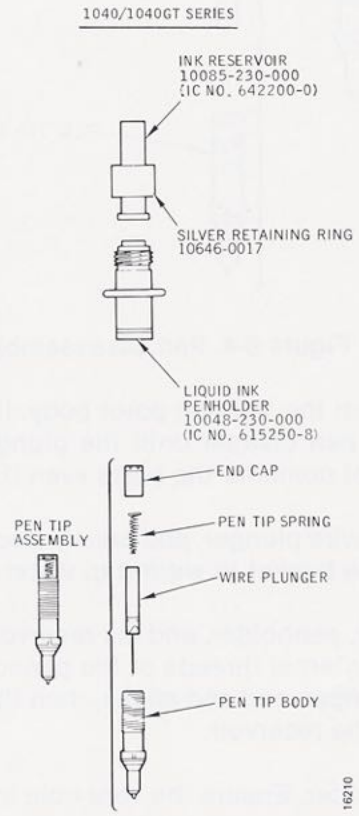


Figure 5-3. Disassembling Liquid Ink Pen

2. Pour the ink out of the reservoir. Lightly tap the reservoir and the rear portion of the penholder body on a piece of absorbent paper to remove any excess ink.

3. Unscrew the pen tip assembly from the penholder body using the CalComp concentricity wrench.

4. Disassemble the pen tip by removing the end cap, pen tip spring and wire plunger from the pen tip assembly. See Figure 5-4.

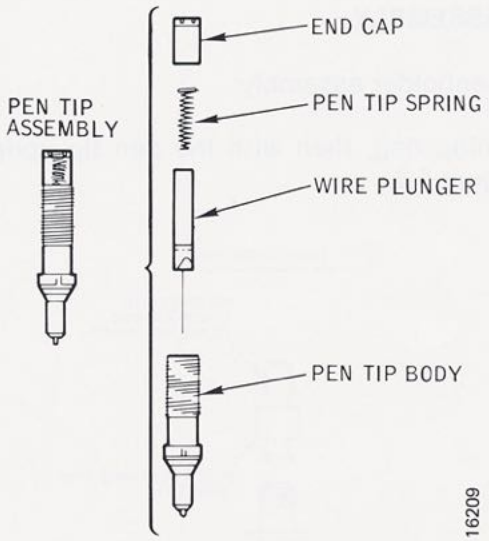


Figure 5-4. Pen Disassembly

Do not force the wire plunger from the the pen point body. If the plunger does not slide out easily, immerse the whole assembly in pen cleaner until the plunger is free. If more than one pen point assembly is being cleaned, do not combine the parts even if the pen points are the same size.

5. Place the end cap, helical spring, wire plunger, and pen tip body in the cleaning basket included in the premium pen kit, and immerse the basket in warm tap water.

6. Thoroughly rinse the pen tip body, penholder, and ink reservoir in warm water to remove all traces of ink. Pay special attention to the internal threads of the penholder. Partially fill the ink reservoir with water, place your thumb over the open end and shake, then flush the water. Repeat this operation as many times as needed to clean the reservoir.

7. Rinse the pen tip parts in clear water. Ensure the vent hole in the point is thoroughly clean.

CAUTION

- *Do not use cleaner on the ink reservoir's silver retaining ring.*
- *Do not clean silver retainer ring with ultrasonic cleaner. Clean the silver ring of all smudges or splashed ink using lukewarm water.*

8. Transfer the rinsed parts to the pen cleaner container and clean them thoroughly.

9. Blow the water out of the pen tip with a syringe bulb. Repeat this procedure several times to allow the inside to dry.

10. Check the pen tip to confirm that the point is clean, not worn, bent, or broken.

11. Use lint-free wipes to dry the pen completely. Twist the wipes and run them through areas where needed.

Storing the Refillable Liquid Ink Pen

Store all refillable liquid ink pens in the supply kit or a closet protected against moisture or extreme temperature.

Do not let pens sit for extended periods of time in turret or pen block between plot jobs. Remove pens and insert into pen humidifier.

The pen humidifier (see Figure 5-5) provides humidification for keeping pens ready for instant start-up between extended non-plotting periods.

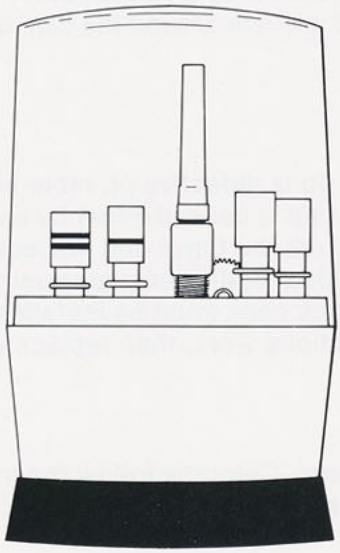


Figure 5-5. Pen Humidifier

Pens containing ink can be stored up to one day in the pen turret. Beyond this, they must be disassembled and cleaned.

CLEANING THE PEN TURRET

Clean the pen turret at least once a week to remove any ink, lint or dust deposits. Wipe out the pen cap with a cotton-tipped applicator moistened with alcohol or pen cleaning solution. Be careful not to damage the pen cap with too much pressure. Allow the pen cap to dry thoroughly before inserting the pens. Never put pen caps in an ultrasonic cleaner.

Replace the pen caps when they begin to show wear. Clean them daily with warm water, ensuring that no ink deposits remain. Return them to the turret. Use the black caps for all liquid ink pens. Use the beige caps for all other pens.

QUESTIONS AND ANSWERS

Are lines completely uniform?

When line quality outweighs plot speed use disposable or refillable liquid ink pens that draw at a relative slow speed.

Lines drawn with a ballpoint pen and most fiber/plastic tip pens are less uniform than liquid ink pens but are drawn at a faster speed.

Do pens seem to run out of ink quickly?

Ballpoint pens plot approximately one-half mile. A fiber or plastic tip pen is good for one-fourth mile. Because of the variations in pen-up and pen-down time, pen life in terms of plot time varies widely.

If a particular pen runs out of ink quickly, then check the pen cap. Occasionally, this protective cover allows air between the tip and the cap and dries out the tip and stops the flow.

Also, if the cap is pressed too tightly on a fiber tip pen, it allows ink to escape even when the pen isn't in operation. If there is an accumulation of ink in or around the cap, or deposits of ink in the pen turret itself, then clean or replace the cap.

Are pens leaking?

If pens are leaking, then either the pen tip is defective or, more likely, the pen cap is not making proper contact with the pen point. A loose pen cap is caused either by a defective cap or by an incorrect type of pen cap. Remove the suspect pen cap from the turret and inspect it. Is there sign of damage or wear? If so, replace it. Is the pen cap the correct kind for the pen you're using? Remember: beige caps go with ballpoints, fiber tip and plastic tip pens; black caps must be installed for both the disposable and refillable liquid ink pens. If none of these suggestions work, then replace your pen.

Does ink flow start immediately?

It is most important to keep the pens clean. Carefully follow the instructions in this section for cleaning the pens. Reclean frequently, at least once a day.

If the ink still doesn't flow after cleaning, then follow these procedures:

1. Reclean all pen assembly components.
2. Check for unobstructed flow of water through the pen tip.
3. Check for a bent wire in the pen tip.
4. Check for a worn or bent pen tip.
5. Reassemble the pen components and test the pen to see if it writes.

If this still doesn't work, use a new container of ink or an ink with less viscosity (for example, dye-based).

Does the ink flow start, then stop?

An air bubble may be trapped in the pen tip. Remove the bubble by holding the pen and tapping it in gently with your finger. Don't try to tap the pen tip against a hard object; this damages the pen.

Foreign material in the pen bore may also cause ink flow to stop. Examine the pen using a pen tip microscope, if one is available. If only a small amount of material has gathered at the tip, it may be dislodged by gentle tapping or wiping the tip with a dry, lint-free cloth. If, however, a large amount of material is deposited in the bore, the pen must be disassembled and thoroughly cleaned.

Does the pen fail to start a new plot?

Even if a pen has just finished plotting without problems, it may have problems starting a new one.

Occasionally the ink may dry on the pen tip between plots. If the expected time between plots is more than four minutes, protect the pen tip from the air by storing it in a pen humidifier. Before starting each plot, clean the accumulation of ink and dirt from the tip with a lint-free cloth. Prime the pen by performing a pen-down X- and Y-axis movement using the manual controls on a portion of the plotting media you will not be plotting on.

Does the pen clog when plotting on matte surface?

All media with a matte surface have a coating that may dust or flake during plotting. CalComp media have been selected for their resistance to this problem.

However, when using any material with a matte surface, run short plots and clean the pen tips frequently. CalComp media with a matte surface may be cleaned before plotting by wiping the surface with a lint-free cloth lightly moistened with alcohol. This removes dirt and dust from the surface and reduces the tendency of the pen to clog. Some media from other suppliers may have a water soluble matte surface and you should not wipe their paper before plotting.

Do the plot lines get wider during plotting?

Lines widen during plotting because of an accumulation of dirt and ink on the pen tip. Periodic cleaning of the tip with a lint-free cloth maintains a constant line width. Cleaning a matte surface before use also helps.

Do pens wear out quickly?

Matte surfaces are abrasive and wear pen tips out more quickly than less abrasive media surfaces. Tungsten tip pens tolerate matte surfaces much better than stainless steel tips and are recommended for use with polyester film plotting media.

Is the plot quality poor?

You may be using a nonrecommended pen tip or media. If this is the case, refer to Table 5-2, Pen Guide, for recommended pen tips. If the pen tip is damaged, replace the pen tip. If there is some other mechanical problem, call CalComp.

Do plot lines look broken?

A pen skips causing broken plot lines when it begins to run out of ink. If this is the case, replace the pen or refill the ink reservoir.

You may have a bad pen tip or there could be some material contamination around the tip. In either case, replace the tip if it looks worn or damaged. Check the pen height and pen force parameters. Refer to Table 5-2 for the height and pen force settings. Occasionally, you might use an incompatible pen and media combination. For instance, stainless steel should be used for paper and vellums, whereas tungsten should be used for polyester film.

Skipping can also be caused by dirty or oily smudges on polyester film. If this is the problem, clean the polyester film with isopropyl alcohol to remove all surface oil and dust. Always handle the plot material at the edges while loading the plotter to avoid future problems. Is the media CalComp approved? If not, this could be your problem.

CHAPTER SIX
ADVANCED PLOTTER FUNCTIONS

INTRODUCTION

The 1040GT Series plotters are designed for easy use. They contain a wide range of sophisticated plotting features derived from the ROMPACK firmware which establishes the initial operational parameter values. These features can be accessed directly from the control panel for interrogation and/or modification.

Most of these features are available through the Set-Up Mode, and are selected simply by following the Menu Select Message display. This chapter describes the procedures for accessing each of the 16 Set-Up Features, and the step-by-step sequence for changing any existing parameter value to fit your plotting requirements.

SPECIAL FEATURES

The additional special features that are not part of the set-up routines that are also described in this chapter include:

- Power-on Routine and Starting Automatic Plotting
- Manually Positioning the Pen Turret
- Manually Selecting a Pen and Verifying Movement
- Setting Plot Limits
- Establishing the Plot Point of Origin
- Returning to the Plot Point of Origin
- Plot Clipping and Windowing
- Resetting the Plotter
- Flushing Input Data Buffer
- Pen Mapping

This chapter covers the special features (in the order listed above) followed by the 16 set-up features in the numerical order assigned to each.

When your plotter was initially installed, the firmware program within the ROMPACK was down loaded into the plotter's memory. This is called EEPROM initialization. The operational parameter values were loaded into all four user memory locations and remain there until they are changed. Whenever a default parameter value is changed you can designate one of the four user memory locations to retain the original default value. (You will probably find it convenient to designate user 1 for this purpose.) This allows you the availability of the three additional user memory locations to save any modified parameter value.

You have the additional choice of either saving the same value in all three memory locations or saving different values of the same parameter in each of the three memory locations. These new values will remain in the user memory locations during a reset or power-off condition if you have performed a save routine. If you have performed a save routine, and an EEPROM initialization is performed, these values will be deleted from all user memory locations and the entire user memory is reloaded with the original firmware default values.

For the protection of your user parameters, you should always record the values that you have changed using the form provided for that purpose in Addendum A.

If, during the performance of any of the plotter set-up features, you decide to abort the execution prior to completion, pressing the AUTO/MANUAL key will return you to the same status in which you were prior to starting the procedure.(Generally, this will require pressing the key twice.)

Power-on Routine and Starting Automatic Plotting

INTRODUCTION

To turn on and run the plotter in Automatic Plotting Mode, follow the steps given in this procedure.

Like most intelligent devices, the plotter has built-in diagnostics and initialization instructions. Failure of the plotter to complete these routines will cause an error message to be displayed. A complete listing of these error message displays and corresponding corrective action is given in Chapter Seven.

All of the information provided in this procedure has already been presented to you in preceding chapters. This procedure is intended as a quick reference summary review only. If assistance is needed, review the detailed information provided in the appropriate chapter prior to continuing with this procedure.

PREREQUISITE

For purposes of this procedure it is assumed that you, the operator, have a basic understanding of the plotter's operational procedures, and the following conditions have already been established.

- The plotter is already installed and power is available.
- The plotter is attached to a host device.
- The host device is ready to send plot data.
- The correct media is readily available for use.
- The correct pens are readily available for use.
- All of the operational set-up features have already been established for your plotting needs, and these have been loaded into one of the user memory locations.

TO TURN ON PLOTTER POWER AND COMPLETE A POWER-ON ROUTINE

Turn on the plotter power. A momentary message appears after the plotter completes the internal initialization.

Display:

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** CalComp **

If the message displayed shows any other message, this will be an indication that the plotter failed the initial Run Time Diagnostic Test. See the chart in Chapter Seven for corrective action and assistance.

The next display will give you the plotter status. Which one of several possible messages is actually displayed will depend upon the status of the following:

- Is the turret installed?
- Is the media loaded?
- Is the safety cover raised or lowered?

When the turret is installed, another momentary message appears and you can observe the turret rotating.

Display:

Turret Init
Please Stand By

TO START AUTO PLOTTING

1. When you have successfully loaded the pens in the turret, loaded the turret on the plotter, loaded the media, and closed the safety cover, this display will appear:

   Display:

   Ready
   Press AUTO to Plot

NOTE

The plotter will always power-up and default to the last user memory location selected prior to the previous power-off. Ensure that you have the correct user memory selected for your plot job prior to proceeding.

2. The plotter is now ready to receive plot data from the host. Press the AUTO/MANUAL key, be sure the AUTO status indicator is lit and the plotter is responding to plot data from the host.

Manually Positioning the Pen Turret

INTRODUCTION

You may use either the keyboard directional keys or the joystick to move the pen turret from one position on the media to another. You will need to know how this is done since such functions as point of origin and clipping/windowing require that you reposition the pen turret and drum precisely to a given position on the media.

NOTE

If available, and accuracy is important, the reticle can be installed to check the pen turret positioning. Otherwise, a close approximation can be achieved by sighting down through the penholder position onto the desired position on the media. Instructions for loading the reticle is provided in Chapter Three.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.

Display:

Ready
Press AUTO to Plot

TO MANUALLY POSITION THE PEN TURRET AND MEDIA

1. Use the keyboard directional keys or the joystick to move the pen turret and media to the desired position.
2. Keyboard keys

   Press the appropriate key corresponding to the direction you wish to move.

KEY	DIRECTION
2	Up
8	Down
4	Left
6	Right
1	Up left diagonal
3	Up right diagonal
9	Down right diagonal
7	Down left diagonal

   Use the FAST (5) key to increase the speed of movement in whichever direction you have chosen. Releasing the directional key will stop movement.

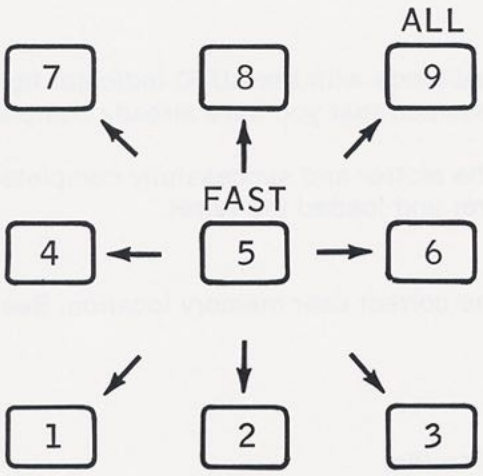


Figure 6-1. Directional Keys

3. Joystick

   Use the joystick as you would any joystick control. The further off center you press the joystick, the faster the drum and/or pen turret will move in the selected direction. When you release the joystick it returns to its center home position, and the drum and pen turret will stop moving.

NOTE

It is not necessary to return the media and pen turret to its original starting place, this will be done automatically. If you want to change this starting point, called point of origin, see the procedure for establishing the point of origin in this chapter.

Manually Selecting a Pen and Verifying Movement

INTRODUCTION

The instructions given in this procedure allow you to manually select a pen from the pen turret and verify that it will write on the media. You will be able to observe the movement of the pen from the turret to the penholder, and its return to the turret. If you have multiple pens loaded into the turret, you will be able to observe the pen selection corresponding to your instructions from the keyboard. With the use of the pen up/pen down and manual movement commands, you will also be able to observe the selected pen(s) writing on the media. This can simulate an actual plot command received during automatic operation.

NOTE

There is no restriction of the media type or pen type in order to perform this procedure. However, you must have some type of media loaded on the plotter, and a pen in at least one of the eight pen positions of the turret.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.

Display:

Ready
Press AUTO to Plot

TO MANUALLY SELECT A PEN AND VERIFY MOVEMENT

1. Press the SELECT key followed by a numeric key corresponding to a pen position in the turret in which you loaded a pen. Observe that the pen moves from the turret to the penholder.
2. Press the DOWN key. Observe that the pen in the penholder has descended onto the media.
3. Use the keyboard manual positioning keys to move the carriage pen turret and media. Observe that the selected pen draws on the media.
4. Press the UP key. Observe that the pen in the penholder retracts from the media.
5. Use the joystick instead of the keyboard manual direction keys. The button on top of the joystick operates in the same manner as the UP and DOWN keys.

NOTE

If you attempt to select any other pen position where no pen is installed, the plotter will automatically reassign that selection to the next position where a pen does exist. For example, if there is only one pen installed in the turret at pen position 3, then no matter what other pen position you select, the plotter will automatically reassign the selection to position number 3.

6. Press the SELECT key followed by the numeric 0 key to return the pen to its proper position in the turret.

NOTE

If you just wanted to verify whether a pen would draw, you can load the pen directly into the penholder and bypass the turret loading described in step 1. You can then use steps 4 through 6 of this procedure to verify that the pen is drawing. Be sure to remove the pen from the penholder when you are finished.

Setting Plot Limits

Plot limits are normally set by the firmware program and the plot program. Unless you are doing a special function, such as clipping or windowing, you will not have to manually set the plot limits.

When the media is loaded, the plotter goes through a routine called seeking paper edges. This sets the hardware limits that so the plotter will not plot off the edge of the paper.

For 36-inch grit drum Roll Mode, the X-axis limit is set to 50 inches, and the Y-axis limit is set inside the width of media by firmware control.

For 15.4-inch grit and sprocketed drum Roll Mode, the X-axis limit is set to 36 inches, and the Y-axis limit is set inside the width of the media by firmware control.

For sprocketed drum Roll Mode, the X-axis limit is set to 100 feet (entire length of the roll), and the Y-axis limit is set inside the width of the media by firmware control.

For Cut Sheet Mode both the X- and Y-axis limits are set inside the media edge by firmware control.

The seeking paper edge routine along with the point of origin routine combine to establish an allowable plot size on the media. This, in conjunction with the plot borders of the plot program, will give you your finished plot size. Of course, if you are doing some manipulating of the drawing such as scaling, rotation, windowing, changing point of origin, or mirroring, this may cause the plotter to drive to an out-of-limit condition. You will have to correct this condition prior to running the plot. In order to correct this condition you will have to decide what caused it and reverse the cause. This analysis can best be done by looking at the plot and deciding what the plotter was trying to do when the condition occurred. The most probable cause is that the plot was too big for the media being used; in other-words, the program was trying to drive the plot off the edge of the media. The most probable solution is to either reduce the scale of the drawing or to change the point of origin.

Establishing Plot Point of Origin

INTRODUCTION

The original firmware default position for the plot point of origin is at the lower right corner of the media as viewed from the front of the plotter. This point of origin is the beginning position of the plot and may be repositioned to any location on the media using the procedure given below.

NOTE

If, at this time you would like to verify where the point of origin is rather than change it, refer to the next procedure (RETURNING TO THE POINTOF ORIGIN) for assistance.

CAUTION

If you change any of the plot positioning parameters of a drawing (scaling, rotation, windowing, point of origin, or mirroring), this may cause the plotter to drive to an out-of-limit condition. You will have to correct or compensate for this condition prior to running the plot. Usually, this means that you will need to change or adjust the plot scale and/or it may be necessary to reposition the point of origin.

PREREQUISITE

1. Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

   - Turned on the power to the plotter and successfully completed a power-on routine.
   - Loaded pens into the turret and loaded the turret.
   - Loaded the media.
   - Closed the safety cover.
   - Verified that you are in the correct user memory location. See Set-Up 0 for reference.

   Display:

   Ready
   Press AUTO to Plot

2. Determine the desired point of origin for your plot. Consult the plot program instructions for assistance.

TO SET THE POINT OF ORIGIN

1. Use the manual positioninq controls to move the pen turret and media to the position you have selected as your point of origin. You may want to refer to the instructions for manually positioning the pen turret for assistance.

NOTE

If available, and accuracy is important, the reticle can be installed to check the penholder position. Otherwise, a close approximation can be achieved by sighting down through the penholder position onto the desired position on the media. Instructions for loading the reticle are provided in Chapter Three.

2. Press the ORIGIN/NEW PLOT key.

   Display:

   New Plot
   YES or NO

3. Press the ENTER/YES key.

   Display:

   Ready
   Press AUTO to Plot

NOTE

If you do not need to check the zeroing out of the plot timer and size counter, steps 4 through 6 may be omitted.

4. Press the PRIOR/TIME key to display time. If the timer is not at zero, pressing the NEW PLOT and ENTER keys will zero the timer.

   Display:

   Auto Time: 00:00:00
   Plot Time: 00:00:00

5. Press the AUTO/MANUAL key twice.

   Display:

   Ready
   Press AUTO to Plot

6. Press the NEXT/SIZE key to display X and Y size. If the size displayed is not at zero, pressing the NEW PLOT and ENTER keys will zero the display.

   Display:

   X = −0000 TO +0000 in
   Y = −0000 TO +0000 in

NOTE

If your plotter configuration is for metric instead of inch, the display for size will display metric units. If you want to change the configuration refer to Set-Up 12 for assistance.

TO EXIT THE PROCEDURE

1. Press the AUTO/MANUAL key twice.

   Display:

   Ready
   Press AUTO to Plot

2. Your plotter has now a new origin defined, and the next plot will start from current pen position.

Returning to the Plot Point of Origin

INTRODUCTION

This operational feature may be used whenever you want to return to the point of origin. You may want to do this as a verification, or to start another plot.

CAUTION

Do not attempt to perform this procedure while a plot is in progress unless you intend to abort the plot.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.

Display:

Ready
Press AUTO to Plot

TO FIND THE POINT OF ORIGIN

1. Press the ORIGIN RETURN key. The pen turret and media will return to the point of origin.

NOTE

If no movement is observed, it is probable that the plotter was already stopped at the point of origin. This can be verified, if desired, by using the manual controls to reposition the pen turret and media to another position. Pressing the ORIGIN RETURN key will then cause the plotter to return to the original point of origin.

2. If a new point of origin is desired, see the previous instructions for establishing a new point of origin.

Plot Clipping/Windowing

INTRODUCTION

With this feature, you can isolate and plot only a portion of any plot. Usually a clipping/windowing function is included with most CAD software packages. CalComp's clipping/windowing function allows you to carry out the same operation directly from the plotter.

Clipping/windowing is similar to cropping a photograph; for example, cutting out a portion of the picture for display or even reducing or enlarging; therefore:

- Clip the drawing to a specific window size.
- Plot that part of the drawing as desired.

PREREQUISITE

1. You must have a copy of the plot you wish to clip. Overlay a clean sheet of media over the existing plot.

2. Outline the desired window area by lightly marking with pencil the four corners of the area to be plotted.

3. Load the marked media on the plotter.

4. Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

   - Turned on the power to the plotter and successfully completed a power-on routine.
   - Loaded pens into the turret and loaded the turret.
   - Closed the safety cover.
   - Verified that you are in the correct user memory location. See Set-Up 0 for reference.

   Display:

   Ready
   Press AUTO to Plot

TO WINDOW A DRAWING

1. Use the manual positioning controls to move the pen turret over the upper left corner pencil mark as viewed from the front of the plotter.

   NOTE

   If accuracy is important, the reticle, if available, can be installed to check the penholder positioning. Otherwise, a close approximation can be achieved by sighting down the penholder position onto the pencil mark.

2. Press the LIMIT key.

   Display:

   Move and Set LIMIT
   or press Clear

3. Press the SELECT key to establish the upper left limit.

4. Use the manual positioning controls to move the pen turret over the lower right corner pencil mark.

5. Press the LIMIT key.

   Display:

   Move and Set LIMIT
   or press CLEAR

6. Press the UP-DOWN/SPACE key to establish the lower right limit.

7. When the plotter has returned to the ready condition and pens are loaded in the pen turret, press AUTO to plot.

CAUTION

If you change any of the plot positioning parameters of a drawing (scaling, rotation, windowing, point of origin, or mirroring), this may cause the plotter to drive to an out-of-limit condition. You will have to correct or compensate for this condition prior to running the plot. Usually, this means that you will need to change or adjust the plot scale and/or it may be necessary to reposition the point of origin.

TO RETURN TO THE ORIGINAL PLOTTING PARAMETERS

Press the LIMIT and CLEAR keys to reset the window to the original margins and erase the windowing parameters prior to exiting the clipping function.

Resetting the Plotter

INTRODUCTION

The RESET key serves a multiple function depending upon the mode of operation of the plotter. See explanation for Flushing Data Buffer for additional information on the Reset feature.

Prompts from the display message such as "RESET When Corrected", is a typical example of one of the uses for the RESET key. In Manual mode the RESET key may be used to return to the READY message from a Set-Up or Test Mode. This is not the preferred way to return to a Ready status because of the possibility of losing data while executing a Reset function.

You must use care if you intend to utilize the Reset function, and be very sure that you understand the consequences.

Pressing the RESET key will:

- Unload the media.
- Exit you from a set-up routine.
- Exit you from a test routine.
- Reset the Plot Timer display.
- Reset the Plot Size display.
- Turn off the LIMIT indicator light.
- Turn off the MESSAGE indicator light.
- Clear a fault condition in response to a message prompt. See Run-Time Diagnostic Message chart in Chapter Seven for a complete listing of these prompts.
- Clear plot data from the plotters servo, optimizer and input buffer. (See Flushing Data Buffers.)
- Clear any plot parameter changes that you have created to any of the set-up features and did not save.

Do not use the RESET key to:

- Unload the media. Pressing the LOAD/UNLOAD key will accomplish this.
- Exit a set-up routine. Pressing the AUTO/MANUAL key twice will accomplish this exit.
- Exit a test routine. Pressing the AUTO/MANUAL key twice will accomplish this exit.
- Reset the Plot Timer Display. Pressing the NEW PLOT and ENTER keys will zero the timer display.

- Reset the Plot Size Display. Pressing the NEW PLOT and ENTER keys will zero the size display.
- Clear plot data from the plotters input buffer while a plot is in progress unless you intend to abort that plot.
- Clear nonsaved plot parameters. The preferred method is to overwrite no longer needed parameters values with the default value.

Flushing Input Data Buffer

INTRODUCTION

This operational feature is useful in freeing the plotter input buffer if you determine that the plot in progress needs to be aborted.

You can also use this feature, if for some reason, the wrong plot has been sent to the plotter and you want to terminate plotting.

Another reason to use this feature may be in response to an error message display, and corrective action requirement defined by the diagnostic message chart in Chapter Seven.

The Flushing Data Buffer feature is in reality an internal part of the Plotter System Reset feature, but is covered by a separate procedural heading for clarity and quick reference. See the information in the instructions for the Reset feature contained in this chapter.

Prior to using this feature, you must first determine if your plotter is operating in the 960 or PCI Mode. You may already know this answer, if not the procedure will provide you with the information to find the answer. You must know this because the execution of this feature is different between the two modes of operation.

Whenever you exercise this feature you will not be able to recover the plot that is presently in progress, so be absolutely certain of what you are doing before executing this feature. All of the conditions listed for the Reset feature, such as losing plot parameter values that have not been saved, also apply to this procedure.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Host Communication, Set-Up 7 is set to meet your interface requirements.

Display:

Ready
Press AUTO to Plot

VERIFICATION OF PCI OR 960 OPERATING MODE

Determine if your operating mode is PCI or 960 . This information should be recorded on the default chart located in Addendum A. If necessary , see the instructions for Host Communication, Set-Up 7, submenu number 3 for assistance.

The display for Set-Up 7, submenu 3 is shown for reference.

Display:

Host Baud Rate =
Mode:1 = 960,0 = PCI

(Mode display will be I or 0)

(Value for Host Baud Rate not shown for clarity)

TO FLUSH THE DATA BUFFERS FOR PCI OPERATING MODE

1. Press the RESET key.

   Display:

   (If the Buffer is Empty)

   Plotter Reset
   YES or NO

   (If the Buffer in not Empty)

   Flush Input Buffer
   YES or NO

2. If the buffer is empty and you press a NO key you will abort this procedure and return to whatever status you were in prior to pressing the RESET key.

3. If the buffer is empty and you press a YES key, you will do a complete reset that will include flushing the input buffer. (See Reset feature description in this chapter.) Upon completion of the plotter reset,the plotter will return to whatever status it was in prior to your initially pressing the RESET key.

4. If the buffer is not empty and you press a NO key, you will abort this procedure and return to whatever status you were in prior to pressing the RESET key.

5. If the buffer is not empty and you press a YES key, you will cause a flush of the input buffer and all subsequent data until the host sends a search address I or a search address 9999. Press the RESET and YES key after flushing the input buffer to perform a complete plotter reset, prior to exiting this procedure. Upon completion of the plotter reset, the plotter will return to whatever status it was in prior to your initially pressing the RESET key.

CAUTION

Several application software packages do not generate a search address. If you are operating with one of these packages in PCI Mode, and have several plots queued up ready to input to the plotter, responding with a YES to Flush Input Buffer will flush all of the plots in the queue until the next plotter Reset is accomplished.

TO FLUSH THE DATA BUFFERS FOR 960 OPERATING MODE

1. Press the RESET key

   Display:

   Plotter Reset
   Yes or No

2. Pressing a NO key will abort this procedure and return to whatever status you were in prior to pressing the RESET key.

3. Pressing the YES key will cause the plotter to perform a complete plotter reset including flushing the input buffer. Any data received from the host prior to the 960 Mode receive data time-out will also be flushed.

Pen Mapping

INTRODUCTION

The 1040GT Series plotters have a pen turret that contains eight physical pen positions. If your plot program contains pen commands for more than eight pens, this pen mapping feature can be used to give you the additional capability of responding to pen commands for up to 16 pens. Your mix and match combinations can vary depending upon the complexity of your plot program, and the actual number of different pens being addressed.

The ROMPACK firmware down loaded an original default value for pen mapping that is shown below. The programmed pen commands are called the logical pen positions. The pause prompt allows an interruption for changing pens and/or ink color if a yes answer is inserted. See the explanation of the pen mapping message display for additional information.

Pen Mapping Default Parameters

Programmed Pen Command (Logical)	Physical Pen Position (Turret)	Pause (Interruption)
1 and 9	1	NO
2 and 10	2	NO
3 and 11	3	NO
4 and 12	4	NO
5 and 13	5	NO
6 and 14	6	NO
7 and 15	7	NO
8 and 16	8	NO

You should never stop a plot in progress to change pen mapping commands unless you intend to abort that plot.

If you have Plot Management, Set-Up 16, enabled and make any changes to the pen mapping parameters prior to starting the plot, you must press the NEW PLOT key before you press the AUTO/MANUAL key and start plotting.

Using the keyboard numeric keys to enter a 99 for a logical pen command position will allow all 16 pens to be mapped to a single physical pen position.

Changes to the pen mapping default parameters can be stored and saved against the user memory locations 1 through 4 in the same manner as any set-up feature. A common practice is to designate user memory location number 1 to save the original default values, and use the remaining three locations for your plotting requirements. You should always record changes to the pen mapping sequence on the chart provided for your convenience. The chart is located on the last page of this procedure. See the description for save routine in this chapter for additional information.

This pen mapping feature does not override any basic operational function of the pen turret. One important factor to remember is that if you assign a logical pen to a physical pen position that does not have a pen loaded, the pen selection process will automatically pick the next higher number available pen in sequence.

The logical pen number that you assign to a physical pen position needs to be compatible with the pen parameters that you have set for that physical pen position. A reminder, if the pen parameters are set to 0 they will automatically default to whatever value is required when the pen band is read upon pen selection. See Setting Pen Parameters, Set-Up 5, in this chapter for assistance.

The pen mapping routine is accessed by pressing the MAP key which is also the numeric 0 key.

See the explanation at the end of this procedure for automatic plotting with pen mapping.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Pen Parameters, Set-Up 5, are set for pens being used.
- Media Type, Set-Up 10, is set to media being used.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE PEN MAPPING FEATURE

Press the PEN MAP key.

Display: cursor

Pen Maps to Pen
Pause:

(Display values not shown for clarity.)

(The SPACE key can be used to move the cursor.)

Explanation of the display:

Pen — This pen number can be 1 through 16 and is called the logical pen number. Using the keyboard numeric keys to key-in the desired number and pressing the ENTER key will cause the cursor to move to the next position on the top line of the display.

Maps to Pen — This pen number can be 1 through 8 and is called the physical pen location. Using the keyboard numeric keys to key-in the number and pressing the ENTER key will cause the cursor to move to the next position on the second line of the display.

Pause: — This prompt requires a YES or NO response and asks if you want to stop between pen selections. A YES response would allow you the capability of changing pen types or ink colors during a pause. Pressing the AUTO/MANUAL key will resume plotting. Using either the ENTER/YES or the CLEAR/NO key to make your selection will cause the cursor to return to the first position on the top line of the display.

TO SET UP A PEN MAPPING SEQUENCE

EXAMPLE: Map logical pen 14 to physical pen 5 with a pause to change pens.

1. Use the keyboard numeric keys to key a 1 and 4. Press the ENTER key. The cursor moves to the physical pen prompt.

2. Use the keyboard numeric keys to key a 5. Press the ENTER key. The cursor moves to the Pause: prompt.

NOTE

Pressing the CLEAR key prior to pressing the ENTER key will cancel any incorrect entry for steps 1 and 2. The SPACE key can be used to move the cursor between the three prompts.

3. To allow a pause to change pens, press the ENTER key. The cursor returns to the first prompt on the top line of the display.

   Display:

   Pen 14 Maps to Pen 5
   Pause: YES

TO SAVE A PEN MAPPING SEQUENCE THAT HAS BEEN CHANGED

NOTE

Once selected, that user number will be the default user until the operator changes it. Therefore, all parameter values stored under that user memory location will automatically be the operational default parameter values.

1. The following display must be on the message displayed before continuing.

   Display:

   Pen 14 Maps to Pen 5
   Pause: YES

   (Values shown are for reference only)

   Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1, 2, 3, or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column in the chart on the last page of this procedure, supplied for your convenience.

TO EXIT THE PEN MAPPING ROUTINE WITHOUT SAVING THE CHANGED MAPPING SEQUENCE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line, will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory to which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power off.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

EXPLANATION OF AUTOMATIC PLOTTING WITH PEN MAPPING

During automatic plotting, when the plotter selects logical pen 14 which you have indicated will be in physical pen position number 1 on the turret the plotter will stop and the message displayed will read:

Display:

Pause on Pen Select
ACT = 1 LOG = 14

Change pens and press the AUTO/MANUAL key to resume plotting. Remember, the new pen you put in physical pen position number 1 must match the pen parameters that you have set for that pen position. A reminder, if the pen parameters are set to 0 they will automatically default to whatever value is required when the pen band is read upon pen selection. See Setting Pen Parameters, Set-Up 5, in this chapter for assistance.

PEN MAPPING SEQUENCE CHART BY LOGICAL PEN AND USER NUMBER

LOGICAL PEN	ORIGINAL DEFAULT	USER NO. 1		USER NO. 2		USER NO. 3		USER NO. 4	
		PHYSICAL PEN	PAUSE YES/NO	PHYSICAL PEN	PAUSE YES/NO	PHYSICAL PEN	PAUSE YES/NO	PHYSICAL PEN	PAUSE YES/NO
1 PEN 1	PAUSE NO								
2 PEN 2	PAUSE NO								
3 PEN 3	PAUSE NO								
4 PEN 4	PAUSE NO								
5 PEN 5	PAUSE NO								
6 PEN 6	PAUSE NO								
7 PEN 7	PAUSE NO								
8 PEN 8	PAUSE NO								
9 PEN 1	PAUSE NO								
10 PEN 2	PAUSE NO								
11 PEN 3	PAUSE NO								
12 PEN 4	PAUSE NO								
13 PEN 5	PAUSE NO								
14 PEN 6	PAUSE NO								
15 PEN 7	PAUSE NO								
16 PEN 8	PAUSE NO								
99 PEN	PAUSE								

SET-UP FEATURES

INTRODUCTION

Parameters that define the basic operating mode(s) of the plotter are initially a programmed part of the ROMPACK firmware and are referred to as the default values. These default values are automatically loaded into the plotter's memory during an initialization process.

The set-up features found in the 1040GT Series plotters allow you to alter these default parameters and create new ones to run programs for specific plotting purposes. These set-up features are:

SET-UP NUMBER	FUNCTIONAL DESCRIPTION
0	Selecting User Number 1 through 4
1	Setting Scale and Rotation
2	Turn On/Off Plot Mirroring
3	Setting Media Alignment (Deskew)
4	Setting Media Compensation
5	Setting Pen Parameters, Pen Number, Time-out, Pen Force, Velocity, and Acceleration
6	Setting Message Display Viewing Angle
7	Setting Host Communication Parameters, Parity and Bits/Char, Stop Bits and Clock, Interface, Host Baud and Mode, Muting and Checksum, Isochronous and EOM, Direct Control and XON, Term Baud and Duplex, Sync Codes and Value
8	Creating Auto Logon Programmed Messages
9	Sending Auto Logon Messages
10	Selecting Media Type, Cut Sheet or Roll, and Roll Width
11	Displaying Plotter Model, 1042, 1043 and 1044
12	Selection of English (Inches) or Metric (Centimeters)
13	Entering Drum Scale Factor Compensation
14	EEPROM Initialization
15	Selecting Display Message Language
16	Turn On/Off Plot Management
17	Setting 1044GT Index Media Length

During the execution of a plot, do not stop the plot to change any of the set-up parameters unless you intend to abort the plot.

Any parameter value you attempt to key-in, that exceeds the allowable value for that parameter will not be accepted when you press the ENTER key. The display will return to show the previous value.

While each set-up feature is unique and requires special selection processes, the initial addressing of each setup is very similar. You will often use the initial addressing steps to simply interrogate a particular set-up routine just to find out what the actual value of the parameter is and then exit the procedure.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Scaling,Set-Up I, is set 1 to 1.
- Rotation, Set-Up 1, is set to 0.
- Mirroring, Set-Up 2, is set with X- and Y-axes off.
- Media Alignment, Set-Up 3, is not set.
- Media Compensation, Set-Up 4, is cleared.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Host Communication, Set-Up 7, is set to meet your interface requirements.
- Media Type, Set-Up 10, is set to media being used.
- Plotter Model, Set-Up 11, displays correct model.
- Inch/Centimeters Display, Set-Up I2, is set to meet your plotting requirements.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

NOTE

The Set-up perquisites shown above with the exception of those set to meet your plotting requirements are the original default parameter values. Those values that you have also changed to meet your applications, may have to be returned to their original default value for other set-up routines because of the interaction between set-ups. For example, if you were performing a setup for media compensation, you would want to make absolutely certain that you had the correct scale factor set for the installed drum prior to setting media compensation.

TO ACCESS THE SET-UP ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select a specific setup.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:

   (The second line of display contains setup number and description)

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the messa gewill display the first prompt of the selected setup.

NOTE

Upon completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

Summary

If you elect to change a default value in any of the set-up features, this new value is temporarily stored in the plotter memory until the plotter is turned off, or until it is overwritten by another value. If you want to retain this new value, you must perform a save routine. This new value will then be placed in whichever user memory location(s) you select, and it becomes the default value for that user operation.

If you do change any of the original default values and perform a save routine, these new values will be retained in user memory unless you perform an EEPROM initialization. The user memory is then erased and reloaded with the original firmware ROMPACK default values. Therefore, if you make any changes to the parameter values, you should record these changes in the chart provided for your convenience in Addendum A. This allows you to easily reload those values you wish to retain after initialization.

On the following pages, you will find the instructions for each of the set-up routines. These routines are organized numerically in the order of their appearance in the selection menu.

Every effort has been made to organize each routine in a logical sequence, and except where the particular sequence does not apply, all procedures are arranged in the following format.

- Introduction
- Prerequisite
- To access the setup routine and preview existing values
- To change the parameter value

(Select one of the last two procedures)

- To save the parameter value that has been changed
- To exit the set-up routine without saving the changed value

This organization should allow you to access a segment of a procedure without going through a step-by-step sequence if you have a portion of the routine committed to memory through practice. As an example, you will find that you will very quickly master the steps necessary to enter a set-up routine, because most all of the sequential steps are similar, regardless of which setup you are trying to access. However, you may still have to refer to the specific procedure to actually change a parameter value.

Save Routine Feature

INTRODUCTION

The 1040GT Series plotters are capable of storing up to four different user configurations. Each configuration is a list of set-up values, changed by an individual user, and stored for later use. Under normal circumstances, you should reserve the original ROMPACK default values in user location number 1; this leaves you the three remaining user locations to store other configurations of the set-up parameter values.

The values stored in the four user memory locations remain in memory even when you turn off the power unless one of the following occur.

- You strike over the existing value with a new value.
- You initialize the EEPROM with Set-Up 14.
- The electronic circuit board within the plotter containing the memory is replaced for maintenance.
- The ROMPACK is replaced with an updated revision.

Any of the above will cause you to lose the user parameter values that you changed from the original default value. In Addendum A, there is a chart for recording changes in any of the set-up parameters. For the protection of your data, any time you make any changes to the parameter values, and execute a save routine, you should protect your data by recording the changes on the chart.

The save routine, in conjunction with the individual set-up procedures, including the selection of user numbers will be used to load the user memory locations with your plotting parameters.

PREREQUISITE

The SAVE/TEST key will only function as a SAVE key if you are in a set-up routine.

TO SAVE A PARAMETER VALUE THAT HAS BEEN CHANGED

NOTE

Once selected, that user number will be the default user until the operator changes it. Therefore, all parameter values stored under that user memory location will automatically be the operational default parameter values.

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1, 2, 3, or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: (Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SET-UP FEATURE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line, will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory to which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from The message displayed.*
- *You turn the plotter power off.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Selecting User Number 1 Through 4 — Set-Up 0

INTRODUCTION

This feature addresses the four user memory locations and establishes the default memory location for power-on. The plotter will always power-up and default to the last user memory location that was selected prior to the previous power-off.

This procedure, used in conjunction with the save routine procedure, is used to load the user memory locations with parameter values that have been changed from the original default value established by the ROMPACK firmware.

This procedure is also used to change from one operating user to another.

CAUTION

The user number displayed when this procedure is completed will be the operating user for all set-up parameter values. As long as this is the user selected, it will also be where all saved parameters are stored during a save routine. Care must be exercised to ensure that you do not inadvertently destroy another users parameter data.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SELECTING USER NUMBER ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number: _____
   Press NEXT for MENU

2. Select User Number Set-up 0

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number: _____
   0 User Number

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   User Number
   (Number displayed is 1, 2, 3, or 4.)

NOTE

On completion of the set-up routine,or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE USER NUMBER

If you want to change the displayed user number, use the numeric keyboard keys to key-in the desired number. If you want to accept the displayed user number proceed to the next step.

TO EXIT THE SELECT USER NUMBER PROCEDURE

Press the ENTER key

Display:

Ready
Press AUTO to Plot

Setting Plot Scale and Rotation — Set-Up 1

INTRODUCTION

The original default parameter value for scaling is 1 to 1. The original default parameter value for rotation is 0 degrees of rotation.

Using the instructions in this procedure, you can scale a plot up or down relative to its original size, and/or rotate a drawing counterclockwise from 1 to 359 degrees.

CAUTION

If you change any of the plot positioning parameters of a drawing (scaling, rotation, windowing, point of origin or mirroring),you may cause the plotter to drive to an out-of-limit condition. You will have to correct or compensate for this condition prior to running the plot. Usually this means that you will need to change or adjust the plot scale and/or it may be necessary to reposition the point of origin.

The scaling and rotation features used in conjunction with the other plot positioning parameters allow you flexibility to create a final plot to meet your application needs.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Media Compensation, Set-Up, 4 is cleared.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Media Type, Set-Up 10, is set to media being used.
- Inch/Centimeters Display, Set-Up 12, is set to meet your plotting requirements.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SETTING SCALE AND ROTATION ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number: _____
   Press NEXT for MENU

2. Select Scaling and Rotation, Set-Up 1.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number: _____
   1 Scale/Rotate

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display: cursor numerator
   denominator

   Scale _____ to_____
   Rotate _____

   (Value of scaling is displayed in four digits from 0001 to 9999).

   (Value of rotation is displayed in three digits from 000 to 359 degrees).

NOTES

Upon completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

If you want to bypass the scaling feature without changing it and go directly to the Rotate feature, pressing the ENTER key twice will accomplish this. However, the user memory will accept whatever value of scaling was on the display when you pressed the ENTER key.

You can use the SPACE key to move the cursor between the scale and rotate display.

TO CHANGE THE PARAMETER VALUE OF SCALING

NOTE

As an example, if you wanted to create a drawing scaled 1:3 (that is, one inch of the new drawing is equal to three inches of the old).

1. Ensure that you are addressed to the correct user memory location.

2. Use the keyboard numeric keys to express the scaling value 1 in the numerator field. (The SPACE key can be used to move the cursor one digit at a time.) Press the ENTER key.

   Display: cursor

   Scale = 0001 to _____
   Rotate = _____

   (Value of denominator and rotate not shown for clarity.)

NOTE

Notice that when you entered the 1 in the numerator field, the cursor moved to the denominator field. Also notice that it was not necessary to key the preceding zeros.

3. Use the keyboard numeric keys to express the scaling value 3 in the denominator field. Press the ENTER key.

   Display:

   Scale = 0001 to 0003
   Rotate =

   cursor

   (Value for rotate not shown for clarity)

TO CHANGE THE PARAMETER VALUE FOR ROTATION

1. Ensure that you are addressed to the correct user memory location.

2. Use the keyboard numeric keys to express the rotation value (Use 180 as an example.) Press the ENTER key. (The SPACE key will also move this cursor position one digit at a time, the same as it did for scaling.)

   Display: cursor

   Scale = 0001 to 0003
   Rotate = 180

NOTE

Notice that the cursor has returned to the first digit on the scaling fraction. If you have entered an incorrect number in either the scaling or rotation display, you can use the SPACE key to reposition the cursor and reenter the correct number.

TO SAVE THE PARAMETER VALUES FOR SCALE AND ROTATION THAT HAVE BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready:

   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SETTING SCALE AND ROTATION ROUTINE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line, will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power off.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Turn On/Off Plot Mirroring — Set-Up 2

Introduction

The original default parameter value for mirroring is with both the X- and Y-axes off. This feature allows you four different possibilities of mirroring, either axis on or off, or a combination of each.

It is very important to remember that the point of origin of the plot will always be at the same point on the plot program but not necessarily the same point on the media if you are using mirroring. Therefore, if you use the mirroring feature, make sure that you have allowed enough media area to compensate for the new origin point on the media.

CAUTION

If you change any of the plot positioning parameters of a drawing (scaling, rotation, windowing, point of origin or mirroring), you may cause the plotter to drive to an out-of-limit condition. You will have to correct or compensate for this condition prior to running the plot. Usually this means that you will need to change or adjust the plot scale and/or it may be necessary to reposition the point of origin.

PREREQUISITE

Make sure the plotter is in manual mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Media Type, Set-Up 10, is set to media being used.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE TURN ON/OFF MIRRORING ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number: _____
   Press NEXT for MENU

2. Select Mirroring, Set-Up 2

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number: _____
   2 Mirroring

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Mirroring _____
   X= Y=

   cursor

   (Selection and display is either OFF or ON.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE ON/OFF SELECTION OF MIRRORING

NOTE

The ENTER/YES key turns on mirroring and the CLEAR/NO key turns off mirroring. The cursor starts at the X selection and moves to the Y selection when the X is entered. When the Y is entered the cursor returns to the X selection. You can also use the SPACE key to move the cursor between X and Y selection.

1. Ensure that you are in the correct user memory location.
2. Press the YES or NO keys to establish the parameter for X selection mirroring.
3. Press the YES or NO keys to establish the parameter for Y selection mirroring.

TO SAVE THE ON/OFF SELECTION OF MIRRORING THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE TURN ON/OFF MIRRORING ROUTINE WITHOUT SAVING THE CHANGED SELECTION

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line, will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory in which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn off power to the plotter.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Setting Media Alignment (Deskew) — Set-Up 3

INTRODUCTION

There is no original default value assigned to this set-up parameter and any value entered is intended for only one individual plot as each preprinted form may have different skew characteristic once it is loaded into the plotter.

The primary use of this feature is to ensure that the plot will be parallel with the lines of a preprinted form or grid media.

To use this feature, you simply line up the reticle in the penholder to two selected points on an existing line (you can pick either a right or left side) on the side of the media and register these points into the plotter electronics. You should pick two points on the preprinted form that are fairly far apart to reduce the possibility of inaccuracies. For instance, assume a printed form with borders 20 inches by 20 inches, pick the lower right and upper right corners as the points 1 and 2.

The plotter will precisely rotate or slant the finished plot to align it parallel with the preprinted lines.

Another advantage of this feature is that you do not have to precisely line up preprinted forms when they are being used on this plotter because this procedure will compensate for any misalignment that may exist.

This procedure requires that you use the reticle that is part of the premium pen kit. If you do not have a reticle, the accuracy required by this procedure cannot be achieved.

CAUTION

This procedure should not be used until you have given the media an opportunity to adjust to the surrounding humidity conditions. See the information about humidity contained in Chapter Four.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Media Type, Set-Up 10, is set to media being used.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

NOTE

Loaded media should be either a preprinted form or grid media. The reticle should be preloaded into the turret.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SETTING MEDIA ALIGNMENT ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number: _____
   Press NEXT for MENU

2. Select Plot Alignment (Deskew), Set-Up 3

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number: _____
   3 Deskew

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Move to First Align
   Point, then ENTER

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE PARAMETER VALUE FOR MEDIA ALIGNMENT

1. Press the SELECT key followed by a numeric key corresponding to a pen position in the turret in which you loaded the reticle. Observe that the reticle moves from the turret to the penholder.

2. Use the manual positioning controls to move the pen turret and reticle directly over point 1 on the media. Press the ENTER key.

   Display:

   Move to Final align
   Point, then ENTER

3. Use the manual positioning controls to move the pen turret and reticle directly over point 2 on the media. Press the ENTER key.

4. Press the SELECT key followed by the numeric 0 key to return the reticle to its proper position in the turret.

5. Remove the reticle from the turret, and install a pen as desired.

TO EXIT THE SETTING MEDIA ALIGNMENT ROUTINE

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

Setting Media Compensation — Set-Up 4

INTRODUCTION

The original default parameter value for this setup is with zero compensation.

This feature compensates for any expansion or shrinkage of the media caused by humidity conditions. If you are using preprinted forms or grid media and you want the plotter to draw exactly on the pre-printed line regardless of the actual measurement of that line, you can use this procedure to scale the plotter to match the form or grid.

This procedure requires that you use the reticle which is part of the premium pen kit. If you do not have a reticle, the accuracy required by this procedure cannot be achieved. The Reticle is available as an accessory. See Chapter Seven for ordering information.

CAUTION

This procedure should not be used until you have given the media an opportunity to adjust to the surrounding humidity conditions. See the information about humidity contained in Chapter Four.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Media Type, Set-Up 10, is set to media being used.
- Inch/Centimeters Display, Set-Up 12, is set to meet your plotting requirements.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

NOTE

Loaded media should be either a preprinted form or grid media. The reticle should be preloaded into the turret.

Display

Ready
Press AUTO to Plot

TO ACCESS THE SETTING MEDIA COMPENSATION ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Media Compensation, Set-Up 4.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   4 Media Compensation

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key. The message displayed will depend upon whether there is already a compensation value other than zero in the user memory.

   Display (if compensation value is not zero)

   Clear Media Comp
   Yes or No

   (A NO selection will abort this setup.)

   Display: (if the compensation value is zero)

   Media Comp

   (selection is yes or no)

   (A NO selection will abort this setup.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, selecting a NO, or pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE PARAMETER VALUE OF MEDIA COMPENSATION

1. Pick two points on the preprinted form that are a known distance apart in X- and Y-axes. Select points fairly far apart to reduce the possibility of inaccuracies. For instance, assume a printed form with boarders 20 inches by 20 inches, pick the lower right and upper left corners as the two points 1 and 2.

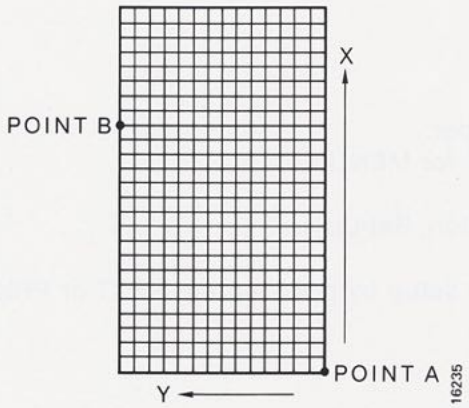


Figure 6-2. Media Compensation

2. Selecting YES will proceed with the compensation setup.

   Display:

   Move to INIT point
   then press ENTER

3. Press the SELECT key followed by a numeric key corresponding to a pen position in the turret in which you loaded the reticle. Observe that the reticle moves from the turret to the penholder.

4. Use the manual positioning controls to move the pen turret and reticle directly over point 1 on the media. Press the ENTER key.

   Display:

   Move to Final point
   then press ENTER

5. Use the manual positioning controls to move the pen turret and reticle directly over point 2 on the media. Press the ENTER key.

NOTE

Using internal computations, the plotter will measure the X- and Y-values between points 1 and 2 to a thousandth of an inch. Therefore, as an example.

Display:

LEN: X = 0019.8772 in.
Y = 0020.2111 in.

6. Use the numeric keyboard keys to enter the intended X-axis distance between points I and 2. In the example, you will enter 20 inches. Press the ENTER key

   Display:

   LEN: X = 0020.0000 in.
   Y = 0020.2111 in.

NOTE

Notice that when you entered the 20 for X-axis, the cursor moved to the Y-axis. Also notice that it was not necessary to key-in the leading zeros.

7. Use the numeric keyboard keys to enter the intended Y-axis distance between points 1 and 2. In the example, you will enter 20 inches. Press the ENTER key.

   Display:

   LEN: X = 0020.0000 in.
   Y = 0020.0000 in.

NOTE

The plot will now be scaled to reflect your instructions to move 20 inches in both the X and Y direction. In the example used, X will be scaled up slightly while Y will be scaled down. Also, notice that the cursor returned to the X-axis. You can use the SPACE key to move the cursor between the two-axes display.

8. Press the SELECT key followed by the numeric 0 key to return the reticle to its proper position in the turret.

9. Remove the reticle from the turret.

TO SAVE THE CHANGES TO THE MEDIA COMPENSATION PARAMETERS

NOTES

Changes to the media compensation parameter default value of zero are not loaded into the user memory locations as most parameter changes are. At the beginning of this procedure one of the two message prompts show a selection for clearing media comp. Changes that you make to media compensation can be reused as long as you have not done any of the following:

- *Cleared media comp*
- *Turned off the plotter power*
- *Completed a system reset*
- *Overwritten that value with another value,*

but these values are never saved by user memory.

TO EXIT THE SETTING MEDIA COMPENSATION ROUTINE

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

Setting Pen Parameters — Set-Up 5

INTRODUCTION

The original default parameter value for this setup will vary depending up on pen type (liquid ink, fiber/plastic and liquid ball). The default values have been established taking into consideration the many factors associated with pen plotting. These established default values will give you good pen life, consistent quality drawings and acceptable plot throughput.

The parameters are variable and can be changed similar to changing any of the other set-up parameter values. However, you may find that you will be unable to change the pen parameter default values without changing the delicate balance between pen life, quality and throughput. This, of course, will also depend upon your individual plotting applications and requirements.

Any mix of pen types can be installed in the pen turret. However, different types of pens possess different parameter values. When the pen is selected, the plotter reads the band configuration of the pen and establishes the pen parameter default value depending upon the values read from the operating user memory location.

TABLE 6-1. PEN ORIGINAL DEFAULT VALUES

Number of Bands	Pen Type	Default Time-out	Default Pen Force	Default Velocity	Default Acceleration
0	Liquid Ink	30 sec.	2	8 ips	1.2 g
1	Fiber/Plastic	—	3	6 ips	1.2 g
2	Liquid Ball	—	10	24 ips	1.2 g

The pen parameter set-up feature has a unique characteristic for establishment of default values. If a zero is selected and displayed, then the actual default value is dependent upon the reading of the bands and the default is set automatically to the above values for that particular pen type. However, the display will always show a zero value; it will not revert to the actual value for display purposes. Do not let this confuse you.

EXPLANATION OF PEN PARAMETER TERMS

Time-out

Applies to liquid ink pens primarily, and is the period of time in seconds a selected pen remains in the plotting position during a lull in the plot program instructions. When the time-out is completed, the pin automatically returns to the turret and is thereby recapped. When plot data is once again sent to the plotter, the last pen used will automatically be reselected and plotting continues.

The allowable range of time-out is 0 through 999, A time-out value of 999 indicates that no time-out is desired. A value of 0 indicates that the original default time-out should be used for this pen type. To change the value of time-out, the three-digit numeric field is keyed and then the ENTER key is pressed. The value is entered and the cursor moves to the pen force field.

Pen Force (PF)

Applies to all three pen types, and refers to the amount of force that is applied to hold the pen point onto the surface of the media. The higher the numerical number, the greater the force. Within reason, the greater the force, the better the line quality, However, it is also true that greater force shortens the pen life. Too little force can cause line skipping.

The allowable range of pen force is 0 through 10. A zero automatically indicates that the original default pen force should be used for the pen type in the penholder. If a number 1 through 10 is keyed in, that value will be used for pen force unless it is greater than the maximum allowable force for the particular pen type being used in which case the value would revert to the maximum allowable value automatically.

Velocity Maximum (Vm)

Also applies to all three pen types, refers to the relative speed of the plotter and pen type combination. Obviously the higher the velocity, the quicker the plot throughput. However, the limiting factor is directly related to pen type, and how well that pen type can lay ink on media. Generally, the slower the velocity the better the plot quality and pen life is increased.

The allowable range of velocity is 0 through 24. A zero automatically indicates that the original default velocity should be used for the pen type in the penholder. If a number 1 through 24 is keyed in, that value will be used for velocity unless it is greater than the maximum allowable velocity for the particular pen type being used, in which case the value would revert to the maximum allowable value automatically.

Acceleration (G)

The acceleration parameter is displayed fractionally in tenths of a G. The allowable range of pen acceleration is 0 through 12. A zero automatically indicates that the original default acceleration should be used for the pen type in the penholder. If a number I through 12 is keyed in, that value will be used for acceleration unless it is greater than the maximum allowable acceleration for the particular pen type being used, in which case the value would revert to the maximum allowable value automatically.

PEN PARAMETER DEFAULT RANGE

The 1040GT series plotters have an established operating range for all the values of pen parameters. In addition, the maximum limit values that have been set for pen force and velocity are protective restrictions, and the plotter will not accept values entered that exceeds these limits.

TABLE 6-2. PEN DEFAULT RANGE AND LIMITS

Parameter	Maximum Limit	
Time-out	All Pens	999 sec.
Pen Force	Liquid Ink	4
Pen Force	Fiber/Plastic	5
Pen Force	Liquid Ball	10
Velocity	Liquid Ink	14 ips
Velocity	Fiber/Plastic	14 ips
Velocity	Liquid Ball	24 ips
Acceleration	All Pens	12/10 g

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Media Type, Set-Up 10, is set to media being used.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SETTING PEN PARAMETER ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Pen Parameters, Set-Up 5.

   - You may scroll to the setup by pressing the NEXT and/or PRIOR keys until the message reads:

   Display:

   Setup Number:
   5 Pen Parameters

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   cursor

   Pen Time-out =
   PF = Vm = G =

   (Selection/Display)

   Pen is 1 to 8, Time-out is 000 to 999
   PF is 0 to 10, Vm is 0 to 24, G is 0/10 to 12/10

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

Pen selection is 1 through 8 corresponding to the 8 pen positions of the turret. However, if you wanted to change the parameters of all 8 pen positions you could select 9/ALL to accomplish this, but they would all have exactly the same parameter values.

The SPACE key can be used to move the cursor from one parameter value to the next. Pressing the ENTER key will also move the cursor to the next parameter.

TO CHANGE THE PEN PARAMETER VALUES FOR PEN SELECT, TIME-OUT, PEN FORCE. VELOCITY, AND ACCELERATION

For purposes of understanding this procedure, use as an example pen 6, with a time-out of 5 seconds, a pen force of 5, a velocity of 7, and an acceleration of 5/10 G

1. Ensure that you are in the correct user memory location.

2. Ensure that the cursor is under the pen number display. Using the keyboard numeric keys, press the 6 key. The display changes to show a pen 6 selected.

3. Press the ENTER key. The cursor moves to the time-out field.

4. Use the keyboard numeric keys, press the 0,0, and 5 keys. The display changes to show a time-out = 005.

5. Press the ENTER key. The cursor moves to the PF field.

6. Use the keyboard numeric keys, press the 0 and 5 keys. The display changes to show a PF = 05.

7. Press the ENTER key. The cursor moves to the VM field.

8. Use the keyboard numeric keys, press the 0 and 7 keys. The display changes to show a Vm = 07.

9. Press the ENTER key. The cursor moves to the G field.

10. Use the keyboard numeric keys, press the 0 and 5 keys. The display changes to show a G = 05/10.

11. Press the ENTER key. The cursor moves back to the pen field.

12. This completes the changes to the pen parameters. Review all the fields to ensure that they have the correct values described in the example. If necessary, you can use the SPACE key to advance the cursor and make corrections. If you change any values at this time you must once again press the ENTER key prior to advancing past that parameter.

    Display:

    Pen 6 Time-out = 005
    PF = 05 Vm = 07 G = 05/10

TO SAVE THE PEN PARAMETER VALUE(S) THAT HAVE BEEN CHANGED

1. Press the SAVE key

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SETTING PEN PARAMETER ROUTINE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory you are presently addressing until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message display.*
- *You turn off power to the plotter.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Setting Message Display Viewing Angle (LCD) — Set-Up 6

INTRODUCTION

The message display viewing angle can be adjusted to compensate for different operator heights. When changing the viewing angle, the message display appears to increase or decrease in intensity.

The original default parameter value for the viewing angle is 8. The range of adjustment is from 0 through 9 and A through F. This provides for 16 different adjustment levels with the default value of 8 falling in the middle.

Changes are made to the viewing angle using the numeric keyboard keys 8 and 2 to scroll through the adjustment levels . The 8 key will increase, and the 2 key will decrease the adjustment value. Used in conjunction with the user number set-up feature and the save routine, you can store up to four different viewing angles to accommodate four different operators.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Language Display, Setup 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SETTING MESSAGE DISPLAY VIEWING ANGLE ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select LCD Viewing Angle, Set-Up 6.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   6 LCD Viewing Angle

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   LCD Viewing Level
   Angle:

   (Value displayed will be one of the following, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 8 is default.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE MESSAGE DISPLAY VIEWING ANGLE

1. Ensure that you are in the correct user memory location.

2. Change the viewing angle by pressing the keyboard numeric 8 key to go up the scale, or the 2 key to go down the scale. The display will change as you proceed. Pick the value with the best display for your viewing.

TO SAVE THE MESSAGE DISPLAY VIEWING ANGLE THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1, 2, 3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

Display:

Ready
Press AUTO to Plot

(Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SETTING MESSAGE DISPLAY VIEWING ANGLE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically by saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory in which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Setting Host Communication Parameters — Set-Up 7

INTRODUCTION

The Host communications set-up is used to establish the host communication interfacing parameters. The complete interfacing information is presented in Chapter Two.

Each parameter has a pre-established default value and a response range for entering any changes. These values are all presented within this procedure.

The Host Communications set-up contains an additional eight-level submenu (nine, if CPGL interface option is installed). To gain access to this submenu, you first access the Host Communications set-up feature in the normal manner of any other set-up feature. Once you have entered the set-up feature, you can use the PRIOR and NEXT keys to access a specific submenu item in the same way you use those keys to access the major menu items.

The original default parameter value for host communications is dependent upon the host computer and interface. The more common RS-232-C default values are shown below for reference.

	Set-Up 7 Submenu Host Communications	ROMPACK Default (See Note)
0	PARITY	0
	BITS/CHAR	8
1	STOP BITS	1
	CLOCK	0
2	INTERFACE	0
	LISTEN ADDRESS	0
3	HOST BAUD RATE	9600
	MODE (960/PCI)	0
4	TERM MUTING	NO
	CHECKSUM ENABLE	YES
5	ISOCHRONOUS	NO
	END-OF-MESSAGE CHAR	03
6	DIRECT CONTROL	NO
	XON/XOFF	NO
7	TERM BAUD RATE	9600
	DUPLEX (HALF/FULL)	0
	TURNAROUND CODE	0
8	SYNC CODE (1/2)	1
	SYNC CODE VALUE	002

NOTE

Default values shown are for RS-232-C interfacing. Other interface parameters may vary. See Chapter Two for additional detail.

The response value ranges allowed for each of the submenu items is shown in Table 6-3. This table also shows the selection possibilities for each item. Keying in a value outside of the range or response allowed will not be accepted when the ENTER key is pressed and the display will return to the previous value. When the ENTER key is pressed, the cursor moves to the next parameter value. The SPACE key can also be used to advance the cursor.

TABLE 6-3. HOST COMMUNICATION PARAMETERS

Menu Selection	Submenu	Response Value Ranges
(selected by PRIOR, NEXT or appropriate numeric keys, followed by ENTER)	(selected by appropriate response prompt)	(respond by pressing appropriate numeric key, YES or NO keys)
0 Parity & Bits/Char	Par:0 = NO, 1 = 0, 2 = E Bits/Char:7/8	Parity = 0, 1, 2 Bits/Char = 7/8
1 Stop Bits & Clock	Stop Bits:1/2 Clock:0 = Int 1 = Ext	Stop Bits = 1/2 Clock = 0/1
2 Interface	0 = Serial, 1 = IEEE488 IEEE488 Address:	Interface = 0/1 Listen Address = 0-30
3 Host Baud & Mode	Host Baud Rate: Mode:1 = 960, 0 = PCI	Host Baud Rate = 110 150 300 600 1200 2400 4800 9600 19200 Mode = 0/1
4 Muting & Checksum	Term Muting:Y/N? Cksum Enable:Y/N?	Terminal Muting = YES/NO Checksum Enable = YES/NO
5 Isochronous & EOM	Isochronous:Y/N? End of Mess Chr	Isochronous = YES/NO End-of-Message Character = 1-31
6 Direct Control & XON	Direct Control:Y/N? XON/XOFF:Y/N?	Direct Control = YES/NO XON/XOFF = YES/NO
7 Term Baud & Duplex	Term Baud Rate: Dplx:1 = half, 0 = full Turnaround Code:	Terminal Baud Rate is the same as #3. Duplex = 0/1 Turnaround Code = 0-31
8 Sync Codes & Value	Sync Codes: 1/2 Sync Code Value:	Sync Codes = 1/2 Sync Code Value = 1-127

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is set to meet your plotting requirements.

Display:

Ready Press AUTO to Plot

Review the information in Chapter Two regarding the switch settings in the interface panel on the right rear pedestal. Ensure that the switches are properly set for your plotting applications and host interface.

TO ACCESS THE SETTING HOST COMMUNICATION PARAMETER ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Host Communications Set-Up 7.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   7 Communications

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Host Setup Number
   Press NEXT for MENU

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO ENTER THE SUBMENU ROUTINE FOR HOST COMMUNICATIONS

1. Select a submenu item from Table 6-3. Pressing the NEXT or PRIOR keys will scroll the display through the eight submenu items until the message reads the desired selection display as shown in Table 6-3.

2. Press the ENTER key and the message will display the prompt or the selected setup as shown in Table 6-3.

TO CHANGE THE HOST COMMUNICATION PARAMETER VALUE(S)

Each parameter value will have to be individually entered if you make any changes to that value. (YES and NO responses require pressing the YES/ENTER or NO/CLEAR key.) Pressing the ENTER key immediately after keying in the new value will enter that value, and advance the cursor to the next parameter within that same submenu. The preferred method to exit each submenu is to press the NEXT or PRIOR keys for the next menu item, and then perform a save routine after completion of the entire procedure.

During the execution of this procedure, you will notice that the CLEAR/NO key will perform the same entry function as the ENTER/YES key if a NO response is required. Without this capability you would be unable to enter a NO response to a prompt.

On completion of the above set-up selection, the message displayed will show a parameter and the existing value. Depending on the parameter, this value may be a YES/NO, a numerical value representing a selection, or an actual numerical value . This value could be either the original default value or some other value that has been previously entered. Regardless, you will have to read the value and determine if it is the value you want to use for your plotting/host interface.

1. Ensure that you are in the correct user memory location.

2. Each display shows two parameters. If the first value is acceptable, press the ENTER key to advance the cursor to the next parameter.(You could also use the SPACE key.) If the second parameter is to be changed, key-in the appropriate value and press the ENTER key.

3. Press the NEXT or PRIOR keys to advance to the next submenu and press the ENTER key.

4. Continue cycling through the submenu until all of the communication parameters have been evaluated and changed as required.

TO SAVE THE HOST COMMUNICATION PARAMETER VALUE(S) THAT HAVE BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number
   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Flushing Host Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SETTING HOST COMMUNICATION PARAMETER ROUTINE WITHOUT SAVING THE CHANGED VALUE(S)

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory you are presently addressing until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power off.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Creating Auto Logon Program Messages — Set-Up 8

INTRODUCTION

The Auto Logon Message set-up feature establishes communication messages that, when used in conjunction with the Send Message, Set-Up 9, can be sent to the host computer. The Auto Logon message display is a two-line display. The upper line is the actual message. The lower line is the ASCII decimal equivalent to the character above the cursor on the top line. Also, on the second line is the housekeeping data for the message such as addressing, positioning and length information.

Prior to using this feature, you must ensure that you are in the correct user memory location. Entries will automatically be loaded into whichever memory you are addressing during the creating of the Auto Logon Message.

This feature has the capability of creating a message up to 232 characters long. This 232-character message can be created in one message string, or you can address and create up to nine different messages as long as you do not exceed the 232-character message length. Each of the four user memory locations has a different 232-character message capability.

Some of the keyboard keys function slightly differently when using this feature. These changes are summarized in Table 6-4. The joystick and the keyboard numeric keys 2,4,6 and 8 can both be used to perform the same function, and which one you use is mostly a matter of personal preference.

The actual character displayed on the top line can be changed by scrolling through the internally available ASCII symbol file using the keyboard numberic keys 2 and 8 or the equivalent positioning of the joystick. The alternative method is to directly key-in the equivalent ASCII decimal value. This method can be used by pressing the numeric 0 key which moves the cursor to the second line display, and then keying in the decimal equivalent using the information presented in Table 6-5. After using either method to change the character displayed on the top line, pressing the ENTER key will advance that character one position to the left on the display line. When the ENTER key is pressed, the housekeeping displays for position and character count change on the second line.

TABLE 6-4. PROGRAM MESSAGE KEYS

Key	Function
0	Dual function key: 1) allows you to enter ASCII code for new character; 2) once in enter mode, becomes normal data key.
Space	Puts a space in the current position.
2	Decreases the current ASCII value by 1.
8	Increases the current ASCII value by 1.
4	Scrolls the message to the left.
6	Scrolls the message to the right.
5	Speeds up the movement of keys 2, 8, 4, & 6.
SELECT	Allows you to choose number of message to be edited. Pressing SELECT key elicits this prompt: SELECT MESSAGE. Key in the message number and press ENTER. The selected message is shown.
AUTO	Exist to the Set-Up menu.
SAVE	Saves the message to the EEPROM and resets to the Set-Up Menu.
ENTER	Enters the data in the field.

NOTE

The joystick can be used in place of the 2,4,6 or 8 keys. The button on the center of the joystick functions the same as the ENTER key during the Logon Message function.

As you scroll through a message, notice that the cursor stays in the same position, while the message moves. Also, any character value less than 32 decimal is displayed as a period.

TABLE 6-5. ASCII TABLE

HEX		0		1		2		3		4		5		6		7	
	BITS B_7 B_6 B_5	Ø Ø Ø		Ø Ø 1		Ø 1 Ø		Ø 1 1		1 Ø Ø		1 Ø 1		1 1 Ø		1 1 1	
	B_4 B_3 B_2 B_1	CONTROL				SPACE - TYPICAL BIAS CHARACTER											
0	Ø Ø Ø Ø	NUL	Ø	DLE	16	SP	32	Ø	48	@	64	P	8Ø	`	96	p	112
1	Ø Ø Ø 1	SOH	1	DC1	17	!	33	1	49	A	65	Q	81	a	97	q	113
2	Ø Ø 1 Ø	STX	2	DC2	18	"	34	2	5Ø	B	66	R	82	b	98	r	114
3	Ø Ø 1 1	ETX	3	DC3	19	#	35	3	51	C	67	S	83	c	99	s	115
4	Ø 1 Ø Ø	EOT	4	DC4	2Ø	$	36	4	52	D	68	T	84	d	1ØØ	t	116
5	Ø 1 Ø 1	ENQ	5	NAK	21	%	37	5	53	E	69	U	85	e	1Ø1	u	117
6	Ø 1 1 Ø	ACK	6	SYN	22	&	38	6	54	F	7Ø	V	86	f	1Ø2	v	118
7	Ø 1 1 1	BEL	7	ETB	23	'	39	7	55	G	71	W	87	g	1Ø3	w	119
		BELL															
8	1 Ø Ø Ø	BS	8	CAN	24	(	4Ø	8	56	H	72	X	88	h	1Ø4	x	12Ø
		BACK SPACE															
9	1 Ø Ø 1	HT	9	EM	25	)	41	9	57	I	73	Y	89	i	1Ø5	y	121
A	1 Ø 1 Ø	LF	1Ø	SUB	26	*	42	:	58	J	74	Z	9Ø	j	1Ø6	z	122
		LINE FEED															
B	1 Ø 1 1	VT	11	ESC	27	+	43	;	59	K	75	[	91	k	1Ø7	{	123
C	1 1 Ø Ø	FF	12	FS	28	,	44	<	6Ø	L	76	\	92	l	1Ø8	|	124
		NEW PAGE															
D	1 1 Ø 1	CR	13	GS	29	-	45	=	61	M	77	]	93	m	1Ø9	}	125
		RETURN															
E	1 1 1 Ø	SO	14	RS	3Ø	.	46	>	62	N	78	^	94	n	11Ø	~	126
F	1 1 1 1	SI	15	US	31	/	47	?	63	O	79	_	95	o	111	DEL RUB OUT	127

FIRST 32 CHARACTERS

See Table 6-6 for an explanation of symbols in the first two columns.

TABLE 6-6. TRANSLATION ASCII CODE SYMBOLS

Symbol	Meaning	Symbol	Meaning
NUL	Null	DLE	Data Link Escape
SOH	Start of Heading	DC1	Device Control 1
STX	Start of Text	DC2	Device Control 2
ETX	End of Text	DC3	Device Control 3
EOT	End of Transmission	DC4	Device Control 4
ENQ	Enquiry	NAK	Negative Acknowledge
ACK	Acknowledge	SYN	Synchronous Idle
BEL	Bell (audible signal)	ETB	End-of-Transmission Block
BS	Backspace	CAN	Cancel
HT	Horizontal Tabulation (punched card skip)	EM	End of Medium
LF	Line Feed	SUB	Substitute
VT	Vertical Tabulation	ESC	Escape
FF	Form Feed	FS	File Separator
CR	Carriage Return	GS	Group Separator
SO	Shift Out	RS	Record Separator
SI	Shift In	US	Unit Separator
		DEL	Delete

PREREQUISITE

Make sure the plotter is in manual mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.

- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Host Communication, Set-Up 7, is set to meet your interface requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE CREATING AUTO LOGON PROGRAMMED MESSAGE ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Program Messages Set-Up 8.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   8 Program Messages

   -----OR-----

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup. If a message currently exist, the display will be different than as shown below, and you can use this step to review the existing message. Pressing the CLEAR key will erase the existing message for the display that is addressed.

   Display:

   A
   (0065) 1 001 000 232

   (The above display is shown with no message currently created for the addressed user's memory location and is shown for reference only.)

Explanation of the display:

A	The top line is the content of the current message in alphanumeric form. When characters are entered they move from above the cursor one position to the left. Unless you are entering the equivalent ASCII code, the cursor remains stationary in this position on the top line.

0065 The first value in the second line is the ASCII code equivalent (in decimal) of the character over the cursor position on the top line. (See Table 6-6 for decimal equivalents.) If you are entering the decimal, the cursor moves to this position when you press the numeric 0 key. Pressing the ENTER key twice returns the cursor to the top line.

1 The next value is the message number from I through 9. The displayed number is the one you are currently creating or viewing. Pressing the SELECT key and the keyboard numeric keys I through 9 will address each of the nine messages. Do not confuse this message number with your user number.

001 The third value shows the character position (above the cursor)for the currently displayed message number.

000 The forth value shows the character length that has been used for the currently displayed message number.

232 The final value is the number of characters left in this particular user's message area. This display starts at 232 and decreases by one number for every character entered in this user memory location.

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CREATE A AUTO LOGON MESSAGE OR TO CHANGE AN EXISTING ONE

1. Ensure that you are addressing the correct user memory location.

2. Ensure that you are addressing the message number in which you want to enter this message in. If you want to change the message number press the SELECT key:

   Display:

   Select Message cursor

   By pressing the appropriate keyboard numeric keys I through 9, the new message number will appear on the display at the cursor position. Press the ENTER key and the display will return to the initial format.

3. Use either the keyboard numeric keys 2 and 8 or the joystick corresponding positioning to select the first character of your message. Press the ENTER key and the character will move one position to the left of the cursor position.

   If your personal preference is to enter directly the ASCII equivalent code, press the keyboard numeric 0 key and the cursor moves to the ASCII field on the second line. Use the keyboard numeric keys and Tables 6-5 and 6-6 to enter the equivalent numeric code.

4. Press the ENTER key and the cursor returns to the top line, and the message character moves one position to the left. Notice that when you press the ENTER key, the third and fourth fields on the second line both increase by one number and the last field decreases by one number.

5. Repeat the access to Auto Logon Programmed Message routine, until you have completed the message for the addressed message display.

6. Address another message display or discontinue the entering procedure . If you address a new message number within the same user's memory and you had already entered another message in a previous message location, the third and forth fields on the second line would be one and zero respectfully but the last field would contain a number less than the 232 original starting point.

7. An existing Auto Logon Message may be erased by first addressing the message and pressing the CLEAR key.

TO SAVE THE AUTO LOGON MESSAGES THAT HAVE BEEN CREATED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location into which you want to store this new message(s). If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new message(s) will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE CREATING AUTO LOGON PROGRAMMED MESSAGE ROUTINE WITHOUT SAVING THE CHANGED MESSAGE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory you are presently addressing until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power off.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Sending Auto Logon Messages — Set-Up 9

INTRODUCTION

The Send Message feature, when used in conjunction with the Auto Logon Message feature, Set-Up 8, allows you to send up to nine different communication messages to the host computer for each of the four different user memory locations.

The send message display is a one-line display that contains the send message number. This number is keyed when using the keyboard numeric keys.

Prior to using this feature you must ensure that you are in the correct user memory location. Messages will automatically be sent from whichever user memory you are addressing during the execution of a send routine. Do not confuse the user memory locations 1 through 4 with the Auto Logon messages 1 through 9. There are nine messages for each of the four user memory locations.

There is no programmed original default value for this feature, and no save routine is required after the execution of this procedure. To exit the set-up routine you press the AUTO/MANUAL key twice.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Host Communication, Set-Up 7, is set to meet your interface requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SENDING AUTO LOGON MESSAGE ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Send Message Set-Up 9.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   9 Send Messages

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Send Message cursor

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO SELECT THE SEND MESSAGE NUMBER

1. Ensure that you are addressing the correct user memory location.

2. Use the keyboard numeric keys to key a message numbers 1 through 9. This number will be displayed above the cursor. Press the ENTER key, this will send the message.

   Display:

   Send Message cursor

3. If you have additional messages to send, repeat step 2 until you have completed the send routine. When you have completed the send routine proceed to the next step.

TO EXIT THE SENDING AUTO LOGON MESSAGE ROUTINE

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

Selecting Media Type — Set-Up 10

INTRODUCTION

The original default parameter values for media type is dependent upon the product model.

MODEL	ORIGINAL DEFAULT
1042GT	Cut Sheet
1043GT	Cut Sheet
1044GT	Roll Feed, 36 inches

The default parameter value can be changed to cut sheet, roll feed or display, depending upon the product model.

MODEL	CUT SHEET	ROLL FEED 36 in	DISPLAY
1043GT	Default	no	no
1042GT	Default	yes	yes
1044GT	yes	Default	no

A yes, where shown, is an allowable change. A no, where shown, is not a valid parameter value and will not be accepted if you attempt to enter it. Defaults, where shown, are the original default parameters.

The model 1043GT is shown for reference only. Unlike the models 1042GT and 1044GT plotters, the 1043GT is a single-mode plotter and operates in a Cut Sheet Mode only. Selecting this set-up feature for a model 1043GT will not be necessary. There is no selectable parameter values for the 1043GT plotter, it is fixed at cut sheet only.

The Dis (Display) feature allows you, when using roll feed media, to drape the media over the front edge of the platen instead of rolling it up on the take-up roll. If you decide to use this capability, you must select the display prompt to prevent the motor that drives the take-up roll from continuing to run. It is important to remember to return to roll selection when you want to roll the media onto the take-up roll. As long as you are in the Display Mode the motor will not wind up the take-up roll.

Changes are made to the media type parameter values using the keyboard numeric keys and keying a 0,1,2 or 3 depending upon the response required from the prompt displayed with this setup.

Used in conjunction with the User Number set-up feature and the Save routine, you can store up to four different media type configurations to accommodate your plotting applications and requirements.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Plotter Model, Set-Up 11, displays correct model.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SELECTING MEDIA TYPE ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Media Type Set-Up 10.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   10 Media Type

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup. The content and format of the display is dependent upon product model.

   Display: cursor (Typical)

   If 1043GT Media? 0 Cut = 0
   Roll-15" = 1, 36" = 2,

   If 1042GT Media? 0 Cut = 0
   Roll-15" = 1,36 = 2,Dis = 3

   If 1044GT Media? 2 Cut = 0
   Roll-15" = 1, 36" = 2

NOTE

If you selected this set-up feature and your plotter model is a 1043GT, the plotter would be returned to the cut sheet status it was in prior to entering the set-up feature because the 1043GT plotter has no variable parameters for media type.

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE SELECTION FOR MEDIA TYPE

1. Ensure that you are in the correct user memory location.

2. Use the keyboard numeric keys to key a number corresponding to the media prompt display for the product model and media type that you are using. The number that you pressed on the keyboard will replace the number above the cursor, and the cursor will move one position to the right.

3. Press the ENTER key. The cursor moves one position to the left.

TO SAVE THE SELECTION FOR MEDIA TYPE THAT HAS BEEN CHANGED

1. Press the SAVE key.
   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SELECTING MEDIA TYPE ROUTINE WITHOUT SAVING THE CHANGED SELECTION

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. On verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SELECTING MEDIA TYPE ROUTINE WITHOUT SAVING THE CHANGED SELECTION

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Displaying Plotter Model — Set-Up 11

INTRODUCTION

CalComp supplies several different firmware ROMPACKS for use with the four models of the 1040GT Series Plotter family. Which ROMPACK you have depends on your plotter model and option configuration. To maintain a firmware/hardware compatibility it is necessary to ensure that the plotter is addressed to the correct model number as it relates to the ROMPACK. This set-up feature is intended only as a verification and interrogation feature. If for any reason you find a discrepancy between your actual plotter model and the model displayed by this setup you should exit this setup immediately and go directly to Set-Up 14 and initialize the EEPROM. This would be an unlikely occurrence, and one that you would probably never see.

CAUTION

Do not use this setup to change the model number displayed. If the correct plotter model is not displayed, see Initialization EEPROM, Set-Up 14.

It is not necessary to be concerned about which user memory location you are in to view this set-up feature. Whatever model number is displayed, it will be displayed in all four user memory locations.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Host Communication, Set-Up 7, is set to meet your interface requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE DISPLAYING PLOTTER ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Displaying Plotter Model, Set-Up 11.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   11 Plotter Model

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup. Displayed plotter model must match actual plotter model.

   Display: (Line Display depends on model.)

   Plotter Model 1042
   Plotter Model 1043
   Plotter Model 1044

NOTE

On completion of the setup routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

CAUTION

If there is a discrepancy between the displayed model number and the actual model number, abort this procedure immediately and go directly to Set-Up 14 to initialize the EEPROM with the correct model number.

TO EXIT THE DISPLAYING PLOTTER MODEL ROUTINE

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

Selection of English (Inches) or Metric (Centimeters) Display — Set-Up 12

INTRODUCTION

The original default selection for this setup is in English unit display. The optional selection is for metric unit display.

This set-up feature affects the control panel message display for decimal displayed numbers only, and has no effect on the plot being done in English or metric scaling.

Used in conjunction with the User Number set-up feature and the save routine, you may desire to set-up one or two user locations for English display and the other(s) for metric to accommodate your plotting applications and requirements.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SELECTING ENGLISH OR METRIC DISPLAY ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select English or Metric Display (Units) Set-Up 12.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   12 Units

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display: cursor

   Units: 0-Eng, 1-Met 0

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO SELECT ENGLISH OR METRIC DISPLAY

1. Ensure that you are in the correct user memory location.

2. Use the keyboard numeric keys and press a 0 if English unit display is desired, or press 1 if metric unit display is desired. The number above the cursor in the display prompt will change to reflect the number pressed on the keyboard.

3. Press the ENTER key.

TO SAVE THE ENGLISH OR METRIC SELECTION THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory locations 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SELECTING ENGLISH OR METRIC DISPLAY ROUTINE WITHOUT SAVING THE SELECTED CHANGE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Entering Drum Scale Factor Compensation — Set-Up 13

INTRODUCTION

The purpose for this set-up feature is to set in a compensation value for each individual drum so that regardless of which drum you use you will obtain a uniform plot size. This compensation routine is necessary because of slight variations that may be encountered with different drums.

If your plotter model, and your plot requirements/applications do not require the use of multiple drums you will probable only have to check this scale factor setting one time and never have to do it again. However, if you are using multiple drums, the common practice is to use the different user memory locations to store the different scale factor values for the different drums. Once again, the chart and Addendum A should be used to record these values as a protection of your data base.

Each drum has been precalibrated and the compensation value is identified with a tag on the end of those drums not installed in the plotter

When you first receive your plotter, the scale factor value displayed for this set-up is always for the drum that is installed on the plotter. This value is also loaded into all four user memory locations. If you are using multiple drums you will have to devise your own allocation system to define which scale factor compensation you load into which user memory location. Two important factors that you need to consider are (1) how many different types of drums do you have, and (2) what is the frequency each drum is used. Obviously, if you have four or less drums your decision is easy. However, if you have more than four drums your decision becomes more complicated. A common practice is to designate one user memory location as a variable, and use that location to enter the scale factor of those drums that are less frequently used, only when you are going to use them.

The nominal value for scale factor is a numerical value of 256, and the range of variation is 132 to 380. The number 256 is the firmware ROMPACK default value but may not necessarily be what is displayed on your plotter display, because the display is factory set for the installed drum.

This procedure also explains the calibration requirements and how the calibration values can be verified using an internal test routine called a Demo Plot. A detail explanation of the Demo Plot is contained in Chapter Seven. The Demo Plot has a 32 by 22-inch boarder that this procedure will use to calibrate the line length.

This set-up routine is similar to the Media Compensation, Set-Up 4, except Set-Up 4 puts a compensated or scaled line within a specific area on the media such as between two preprinted grid lines. This setup takes a fixed length plot line and effectively scales the mechanical axis so the end result will be that a specified length plotted line is really the specified length regardless of which drum you are using to plot with.

It is very important that you observe the prerequisite requirements for this setup, particularly important is to remove any compensation such as media compensation that is associated with the value of line length.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret (liquid ink and fine pen point preferred).
- Loaded the media (polyester film is preferred).

- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Scaling, Set-Up 1, is set 1 to 1.
- Rotation, Set-Up I, is set to 0.
- Mirroring,.Set-Up 2, is set with X and Y axes off.
- Media Alignment Set-Up 3 is not set.
- Media Compensation, Set-Up 4, is cleared.
- Media Type, Set-Up 10, is set to media being used.
- Plot Management, Set-Up 16, is set to NO.

(See specific set up instructions if assistance is required.)

Display:

Ready
Press AUTO to Plot

TO ACCESS THE ENTERING DRUM SCALE FACTOR COMPENSATION ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Scale Factor, Set-Up 13.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   13 Scale Factor

   --------OR--------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   SF: X = 256, Y = 256

   (Values shown are the original default values.)

   (The actual value shown must be associated with the drum that is installed on the plotter. If necessary, use the procedure below to calibrate the drum and calculate what the required scale factor compensation should be).

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE SCALE FACTOR IF THE VALUE OF COMPENSATION IS KNOWN

1. Ensure that you are addressed to the correct user memory location.

2. If the value of scale factor compensation is known, use the keyboard numeric keys to set the X value in three digits, press the ENTER key, followed by setting the Y value and pressing the ENTER key.

TO CALIBRATE THE DRUM AND CALCULATE THE SCALE FACTOR

1. Record the current scale factor value displayed.

2. Using polyester film and liquid ink pens with a fine point, plot a copy of the Demo Plot. See Chapter Seven if assistance is needed to run the Demo Plot.

3. The sides of the Demo plot measure 22 by 32 inches as driven by the plot program. Be as accurate as you possible can, measure the actual sides (boarders), and record the value of deviation from 22 and 32 inches.

4. There are two methods to calculate the value of scale factor. The first method is faster and adequate for most applications. The second method is the more accurate of the two.

    - Method 1: To make an axis longer, add one count to the currently displayed scale factor value for each 0.001 inch of deviation. To shorten the axis, subtract one count from the value for each 0.001 inch of deviation.

Example: Current X scale factor 256 (for example only) 32 inches x Deviation = 0.050 inches long New X scale factor value = 256 - 50 = 206

    - Method 2: use the following formula to determine the correction factor.

$$CF = \frac{D \times 32767}{L}$$

where D = Amount of deviation in inches
L = Desired length
CF = Correction factor

5. To make an axis longer, add the correction factor to the currently displayed scale factor value. To shorten the axis, subtract the correction factor from the value displayed.

Example: $CF = 0.050 \times \frac{32767}{32} = 51.20$

CF = 51 Rounded off

new scale factor 256
for X axis -51
205

6. On completion of the calculation of either method for both axes, return to the scale factor Set-Up and obtain the scale factor display prompt.

7. Select a user memory number, and enter the value calculated above.

8. Set-up and run another copy of the Demo Plot. If the sides measure 22 inches and 32 inches, ±0.030 inches, you have successfully completed calibrating the drum. If the measurements are not within the tolerance range repeat the calculation portion of this procedure again until you can produce a Demo Plot within the tolerance range.

TO SAVE THE SCALE FACTOR COMPENSATION VALUE THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. On verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE ENTERING DRUM SCALE FACTOR COMPENSATION ROUTINE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

EEPROM Initialization — Set-Up 14

INTRODUCTION

When you initially received your plotter, the set-up parameters were loaded into all four user memory locations from the default values programmed into the ROMPACK. Using this function to initialize the EEPROM means that all user memory locations are erased and reloaded with the original programmed ROMPACK data.

CAUTION

If you have changed any of the original default values, these changes will be erased when you initialize the EEPROM.

If you have not already done so, you must record any parameter changes that you wish to retain, prior to initializing the EEPROM so that you can reload those values back into the appropriate user memory locations upon completion of this procedure. For your convenience, there is a chart in Addendum A for recording the changes to the set-up parameters .

During this procedure you will be prompted to enter the model number of your plotter. This number can be found on the right pedestal and also on the nameplate located on the lower rear center support plate. In order for the ROMPACK firmware to load-in the appropriate plotter commands for your plotter model, you must enter the correct model number.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE EEPROM INITIALIZATION ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Initialize EEPROM Set-Up 14.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   14 Initialize EEPROM

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Initialize EEPROM

   (Display shown is YES or NO.)

   (A NO selection will abort this setup.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO INITIALIZE THE EEPROM

1. If you select NO, Set-Up 14 is aborted. If you select YES, the message reads:

   Display:

   Are you Sure

   (Selection is YES or NO.)

2. If you select NO, Set-Up 14 is aborted. If you select YES, the message will display the prompt shown below. Displayed plotter model must match actual plotter model.

   Display: (Line display depends on model.)

   Plotter Model 1042
   Plotter Model 1043
   Plotter Model 1044

3. This selection requires that you key-in the last two digits of your plotter model if you need to change the display. Either key-in the two digits and press the ENTER key or simply press the ENTER key if the display is already correct.

4. For approximately 50 seconds the display will read:

   Display:

   EEPROM Init
   Please Stand-by

TO EXIT THE EEPROM INITIALIZATION ROUTINE

1. When the initialization is completed, the display will read:

   Display:

   Position Carriage &
   Load Paper Please

   (Use keyboard controls or joystick to manually position carriage a minimum of five inches from right side support. This allows correct carriage sensor position response during the automatic load routine.)

2. Reenter and save all parameters that you decided to retain prior to starting this procedure. If necessary, refer to the individual instructions for the specific setups to aid you in reentering this data.

Selecting Display Message Language — Set-Up 15

INTRODUCTION

The Select Language setup allows you to select one of five different languages for the message displayed. The original default selection for this feature is English.

The select language feature contains a submenu that allows you to use either the PRIOR and NEXT keys for a scroll selection, or the keyboard numeric keys can be used for selection by directly keying the menu number similar to any set-up menu selection process.

MENU NUMBER	LANGUAGE	
0	English	
1	Katakana	Japan
2	French	Francais
3	Italian	Italiano
4	German	Deutsch

It is important that you have a understanding of how this feature functions. It is possible that a previous user may have left the plotter displaying a language you are not familiar with and you need to revert to a familiar language. If you can not understand the prompts, you need an alternative method for proper setup. The sequential steps in this procedure will provide you that method.

Changes you make to the language display feature will not display in the newly selected language until you exit the Set-Up mode.

If your application requirements demand the capability, it is possible to have different user memory locations display in different languages.

This feature affects the control panel message display only, and has no effect on any other function within the plotter including the Auto Logon Message sent to the host. That data is sent in ACSII format, so whatever the host is set up to receive and display, that is what it will accept regardless of your plotter language selection.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Viewing Angle, Set-Up 6, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE SELECTING DISPLAY MESSAGE LANGUAGE ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Language Display, Set-Up 15.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   15 Select Language

   ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   cursor

   Language Used 0
   Press Next for MENU

   (The default value for English is shown.)

MENU NUMBER	LANGUAGE	
0	English	
1	Katakana	Japan
2	French	Francais
3	Italian	Italiano
4	German	Deutsch

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE LANGUAGE DISPLAY SELECTION

1. Ensure that you are in the correct user memory location.

2. Using either the PRIOR and NEXT key or the keyboard numeric 0,1,2,3 or 4 keys, select the language display to meet your plotting requirements.

3. Press the ENTER key.(The display will not change to display in the selected language until after you exit the Set-Up Mode.)

TO SAVE THE LANGUAGE SELECTION THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

Display:

Ready
Press AUTO to Plot

(Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE SELECTING DISPLAY MESSAGE LANGUAGE ROUTINE WITHOUT SAVING THE CHANGED SELECTION

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Turn On/Off Plot Management (Optimize) — Set-Up 16

INTRODUCTION

The original default selection for the Selecting Plot Management set-up feature is to enable optimization.

CalComp's proprietary Plot Management algorithm minimizes pen changes and axes movements. This is accomplished internally within the plotter by rearranging the host data in such a way as to allow the plotter to run faster than the CAD software alone might accomplish. This feature is particularly useful for liquid ink applications because it minimizes the delays involved in multiple pen changes only for the purpose of recapping a liquid ink pen.

When the Plot Management feature is enabled, several operational considerations apply because of the difference in the way incoming plot data is manipulated and stored in the input buffer (memory) by the plotter. These considerations include:

- When data is received from the host, it is arranged in vector blocks according to a specific algorithm.

- If you have Plot Management, Set-Up 16, enabled, and make any changes to the pen mapping parameters prior to starting the plot, you must press the NEW PLOT key prior to pressing the AUTO/MANUAL key and start plotting. Any new plot commands that may have already been manipulated for optimization by the plot management function need to be reevaluated by the optimizer. Pressing the NEW PLOT key will cause this plot data to be automatically remanipulated prior to beginning to plot. Remember, just because the plotter is not plotting does not necessarily mean that the host is not sending data, the first plot command may already be on the plotter input data line. See the explanation for Pen Mapping in this chapter if assistance is needed.

- When a running plot is terminated (aborted) the Reset Routine must be completed before a new plot can be started again. This allows the input buffer to be cleared. If the RESET key is pressed, remember all of the other consequences of the Reset feature, and take the appropriate action prior to continuing on with a new plot. If assistance is needed, see the explanation for the Reset feature in this chapter.

When using the 1040GT Series plotters with software packages that contain optimization or vector sorting features, CalComp recommends that these features be disabled at the host to maximize the performance of the CalComp Plot Management feature. For those occurrences when you want the host's software to handle the optimizing of the plot data, disabling the plotters Plot Management feature would be the best solution.

There are a few other conditions when you might want to disable the Plot Management feature. For example, if your plotting requirement was for a short duration plot , (small size with just a very few lines) it is possible that the rearrangement of the data by the plot management algorithm might be more time consuming than just running the plot without plot management enabled.

The Plot Management feature will place a plot in the predetermined area in the same manner as without plot management enabled (point of origin, position, and size). However, the plot management algorithm will control the sequence in which the plot is drawn. If for some reason you want the sequence of plotting to be in the same order as the original plot program, (such as to view a segment of a plot) disabling the optimizing feature will allow this to occur.

Depending on how the original plot program was written, it might be more practical to disable the Plot Management feature to do a Clipping/Windowing feature.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed will depend on plotter status. It is assumed that you have already completed the following.

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE TURN ON/OFF PLOT MANAGEMENT ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Plot Management, Set-Up 16.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

   Display:

   Setup Number:
   16 optimize

   -------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Enable Optimization
   Yes or No: YES

   (The default value is YES.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/Manual key twice will return you to whichever status you were in prior to entering the set-up feature.

TO TURN ON/OFF PLOT MANAGEMENT

1. Ensure that you are in the correct user memory location.

2. Enable the Plot Management selection by pressing the ENTER/YES key. Disable the Plot Management selection by pressing the CLEAR/NO key.

TO SAVE THE TURN ON/OFF SELECTION THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. Upon verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: —(Momentary)

   User Number
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value in the appropriate user column on the chart supplied for your convenience in Addendum A.

TO EXIT THE TURN ON/OFF PLOT MANAGEMENT ROUTINE WITHOUT SAVING THE CHANGED SELECTION

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory into which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

Setting 1044GT Index Media Length — Set-Up 17

INTRODUCTION

This set-up routine operates with the 1044GT plotter and is intended as an aid in running the plotter unattended. Each time an INDEX command is received by the plotter it activates this routine.

If the plotter is set for inch display, the value displayed will be in inches. If the plotter is set for metric display, the value displayed will be in metric (mm).

The value entered in the set-up prompt advances the plotter media by the amount of that value prior to the beginning of the plot, to ensure that there is sufficient media left on the supply roll to complete the plot. The advanced media automatically returns to the supply roll prior to the beginning of plot.

A setting of 000 effectively disables this set-up routine. The original default value for media length is also set for 000.

A maximum numerical value of 765 can be keyed in from the keyboard. This value can be saved in one or all of the user memory locations using the save routine.

PREREQUISITE

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message displayed depends on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location. See Set-Up 0 for reference.
- Language Display, Set-Up 15, is set to meet your plotting requirements.

Display:

Ready
Press AUTO to Plot

TO ACCESS THE INDEX MEDIA LENGTH ROUTINE

1. Press the SET-UP key.

   Display:

   Setup Number:
   Press NEXT for MENU

2. Select Index Media Length, Set-Up 17.

   - You may scroll to the setup by pressing the NEXT or PRIOR keys until the message reads:

     Display:

     Setup number:
     17 Index Length

     ------OR------

   - You may directly select the desired setup by using the numeric keyboard keys.

3. After either of the two methods, press the ENTER key and the message will display the first prompt of the selected setup.

   Display:

   Enter Index Media
   Length: 000

   (Value displayed will be 000 to 765 Default is 000.)

NOTE

On completion of the set-up routine, or if you want to discontinue the routine, pressing the AUTO/MANUAL key twice will return you to whichever status you were in prior to entering the set-up feature.

TO CHANGE THE INDEX MEDIA LENGTH VALUE

1. Ensure that you are in the correct user memory location.

2. Change the media length by pressing the keyboard numeric keys to enter in the value in either inches or metric. The display will change as you proceed. Pick the value that will represent the length of the longest plot that will be done.

TO SAVE THE INDEX MEDIA LENGTH VALUE THAT HAS BEEN CHANGED

1. Press the SAVE key.

   Display:

   User Number

   (Number displayed is 1,2,3 or 4.)

2. Verify that you are in the user memory location in which you want to store this new parameter value. If not, use the keyboard numeric keys to select the correct user memory location 1, 2, 3 or 4. If assistance is needed, see Set-Up 0 for a full explanation.

3. On verification of correct user memory location, press the ENTER key and the new parameter will be loaded into that selected memory location. Display will return to whatever display was shown prior to entering this set-up routine.

   Display: — (Momentary)

   User Number:
   Saving User Data

   (User number not shown for clarity.)

   Display:

   Ready
   Press AUTO to Plot

   (Typical)

4. Always record the changed parameter value.

TO EXIT THE INDEX MEDIA LENGTH ROUTINE WITHOUT SAVING THE CHANGED VALUE

CAUTION

Values of parameter changes not saved at the time of change, but allowed to remain on the user memory input line will automatically be saved if you later perform a save routine for another parameter. It is a good practice to remove these temporary changes as soon as you are through using them. This can best be done by simply overwriting that value with the original default value.

Press the AUTO/MANUAL key twice. The plotter will return to whatever status it was in prior to entering the set-up feature.

Display:

Ready
Press AUTO to Plot

(Typical)

NOTE

Changes to any parameter default value not loaded into a user memory location will remain a valid usable value for the user memory in which you are presently addressed until one of the following occur:

- *You cause the value to be cleared in response to a prompt from the message displayed.*
- *You turn the plotter power OFF.*
- *You complete a system reset.*
- *You overwrite that value with another value.*
- *You initialize the EEPROM.*

CHAPTER SEVEN
TESTING, TROUBLESHOOTING AND MAINTENANCE

INTRODUCTION

By following the tutorial and procedural instructions given in this User's Guide, you should be able to operate the plotter in a trouble-free environment. If, however, you do discover a suspected problem, the information provided in this chapter should help you to understand that delicate balance between what you expect from the plotter, and what the plotter is capable of providing.

For your convenience this chapter is divided into five sections:

- Troubleshooting Chart
- Run-Time Diagnostic Message Chart
- Plotter Test Routines
- Preventive Maintenance Procedures
- Call for Assistance

The section containing the Troubleshooting chart shows in a problem/possible-cause-to-solution format, the more likely type of problems that you will encounter with pens, inks and media. This type of chart is probably already familiar to you. It is a common format for equipment of this complexity.

The section containing the Run-Time Diagnostic Message chart shows the status and corrective action message prompts that are displayed. The chart provides an explanation and solution for each display.

The section containing the Plotter Test routines is an explanation of the operational procedures for accessing the plotters internal test capabilities.

The section containing the Preventive Maintenance Procedures provides the procedural steps for inspection, cleaning and routine performance checkout of the plotter.

The section containing the Call For Assistance provides you with the information necessary to obtain assistance from either your local CalComp service center or from the Hot Line service. Also listed in this section is the informational requirements needed by CalComp to adequately respond to your questions. Please review these helpful guidelines before seeking assistance.

See Bibliography for a complete listing of all CalComp publications relating to this product.

There are many factors that contribute to fine quality plotting. With a little experience you will master most if not all of them very quickly. For review, the major factors over which you have a direct control are listed below. If you suspect that you have a problem, you may want to review this list to ensure that you have done all that is necessary to contribute to the quality plotting before attempting any further analysis of a suspected problem.

- Inspect the type, brand, quality and physical condition of the ink, pens and media for compatibility with your specific plotting applications.
- Review the pen speed, pen force, pen acceleration and mechanical performance of the plotter for compatibility with your specific plotting applications.
- Evaluate the termperature, humidity, and cleanliness of the plotting environment.
- Ensure that you are not overloading your available electrical circuits.
- Ensure that the interface and operational set-up parameters are compatible with the plotting program delivered from the host.

A very helpful feature in assisting you in the operational analysis of your plotting system is the internally available Demo Plot. This plot is a part of the ROMPACK firmware program and can be run independently of any host computer. This can be useful in isolating a suspected problem between the host, the host plot program, and the plotter. You might find it advantageous to retain an acceptable quality Demo Plot for later comparison with a freshly run Demo Plot if you suspect a degradation of plot quality.

TROUBLESHOOTING

Introduction

The Troubleshooting table below lists possible problems you might encounter with pens, inks and media during the performance of a plot program. No list can be absolutely complete and cover every possibility. What this list has done is taken the most probable cause and solution ratio to provided you with the best answers based on CalComp's many years of experience in the vector plotter marketplace.

Additional assistance and information for pens, inks and media may be obtained by reviewing Chapters Four and Five in this User's Guide.

If you are experiencing problems with pens, inks and media, ensure that you have all of the correct pen and media parameter values loaded and addressed for your specific plot applications. See Chapter Six for additional information about the following routines that directly affect pen, ink and media performance.

- Manually Positioning the Pen Turret
- Manually Selecting a Pen and Verifying Movement
- Setting Plot Limits
- Plot Point of Origin
- Plot Clipping/Windowing
- Pen Mapping

The Set-up routines described in Chapter Six, that have a direct effect on pens, inks and media applications are listed below for your reference.

Set-up Routine	Functional Description
0	Selecting User Numbers 1 through 4
1	Setting Plot Scale and Rotation
2	Turn ON/OFF Plot Mirroring
3	Setting Media Alignment
4	Setting Media Compensation
5	Setting Pen Parameters • Pen Number • Time-Out • Pen Force • Velocity • Acceleration
10	Selecting Media Type • Cut Sheet • Roll • Roll Width
13	Entering Drum Scale Factor
16	Turn ON/OFF Plot Management

The pens, inks and media applications and compatibility charts in Chapter Eight provide an excellent cross reference check list for your specific usage of pens, inks, and media.

Through experience, and the use of this complete User's Guide, you will find just the right combinations for your plotting applications. Just as importantly, you will learn and understand setup and compatibility, and how very vital that is to successful plotting.

TROUBLESHOOTING CHART

PROBLEM/POSSIBLE CAUSE	SOLUTION
Pen does not write.	
Pen is out of ink.	Get a new pen (fiber, ballpoint or disposable liquid ink) or refill the reservoir (refillable liquid ink).
Fiber/Plastic tip is dried out.	Replace the pen. When plotting, be sure to use beige fiber tip pen cap in the turret with fiber/plastic tip pen. This protects the pen from drying out. Leave new pens in their sealed packages until needed.
Liquid ink pen is dried out or air vent in the pen cap is clogged.	Clean the outside of the pen body and the rubber cap in the turret. Prime the pen by applying suction with a syringe bulb; then draw with the pen. It may help to dip the tip in water. If priming doesn't work within a minute or two, carefully clean all parts of the pen. Follow instructions in this User's Guide. Use the correct black cap in turret for both disposable and reusable liquid ink pens. These caps are designed to protect pen tips from drying out.
Liquid ink pen's cleansing wire is bent.	Check the pen very carefully using a magnifying glass. If the cleansing wire is bent, replace the pen point.
Pen is defective.	A rare possibility. Check all other possibilities first. Increase pen force; decrease pen speed. If still faulty, then return pen to CalComp or original supplier.
Pen dries out before it is used.	
Pen cap may be wrong, or out of alignment.	Carefully inspect the cap in the pen turret. Remember, liquid ink pens use black caps while all other pens use beige caps. If a cap is damaged or missing, replace it.
Replacement pen appears to be dried out when it is first used.	Keep pens in their original packages until use.
Relative humidity is low.	In dry climates (less than 30 percent humidity) pens and ink will dry out more quickly. Make sure pens are always capped when not in use.
Beginning of line does not show.	
Pen tip was partially dried out or pen was temporarily clogged.	Beginning of the line should have primed the pen. If pen has been sitting a long time in the turret, prime it manually on a piece of paper before using in the plotter. For liquid ink pens, try priming the point with the suction bulb.

	If this doesn't work, either replace the pen (fiber/plastic or ballpoint) or remove and clean the tip (liquid ink).
Water-diluted ink.	For liquid ink pens, a drop of water in the tip or the cap has diluted the ink. Dry tip and cap completely before reusing.
Pen pressure is inconsistent.	Make sure the pen is properly seated in the turret, or it may be improper pen spring pressure. The pen coil sensor in the turret may be dirty.
Ballpoint start-up pattern.	Ballpoint pens frequently deposit a dot of ink previously deposited on the ball, followed by a brief uninked area. Store your ballpoint pens vertically, tip down.
Pen skips or drags.	
Pen tip is in poor condition.	Check pen tip. Compare tip to new one. Discard pen if the tip is in poor condition.
Liquid ink pen is partially clogged.	Particles of ink, dust or lint can cause pens to skip, especially at higher speeds. Clean the point and ink reservoir thoroughly. Swab out the pen cap on the turret.
Pen force is set incorrectly.	Check the amount of force being used. See Set-Up 5 (Chapter Six). Change pen force, if needed.
Plotting media is the wrong weight or thickness.	Plotting media is too thin or too thick, causing pens to skip or drag. Change to an appropriate media.
Plotting media has oil on its surface.	Skin oil, lanolin, surface film, or some other agents repel ink. Correct the problem by using a new sheet of media. Keep your hands clean while working with the media, and always handle it by the edges only.
Plotting media has a watermark on it.	Some brands of media, like bond, contain a manufactuer's watermark. If skipping occurs in this area, decrease pen speed to allow the ink to flow over the impression.
Plotter may need service.	There are certain problems, such as height adjustment or some other mechanical adjustment you cannot make. Call your CalComp service representative.
Pen tip clogs/Ink blobs on paper.	
Pen force may be too high.	Drafting pens may clog when the pen force is set too high. The pen tip may be dislodging bits of paper fiber. Decrease pen force using Set-Up 5 (Chapter Six).
Pen speed, ink flow, absorbency of the media and pen tip width are not in balance.	When ink flows from the pen faster than the media can absorb it, or when the media is porous, blobs appear. This is a more common problem for liquid ink pens. Experiment with the plot, varying one factor at a time: for example, pen speed, ink viscosity, type of media and pen tip width. Eliminate possible problems and isolate the true cause.

Pen speed is too fast for liquid ink pen.	When the speed is too fast, the line is thin during the fast movements of the pen, but grows thick when the pen slows down at the ends of the line segments and at the corners and curves. Lower the pen speed to correct the problem. (See Set-Up 5, Chapter Six.)
Ink has leaked around the liquid ink pen tip.	If ink has leaked around the top of the pen tip where the pen adapter meets the tip, the internal airflow may be obstructed or the vent hole clogged. Clean the pen. Don't shake it.
Liquid ink tip is dirty.	Dried ink or media particles have clogged the tip. Clean the pen thoroughly.
There is static buildup on pens or plotting media.	In low humidity, static may cause dust and particle accumulation, especially when plotting on polyester film. To reduce the problem, slow down the pen speed, increase the humidity in the room, try another type of media with more static resistance, or change to another plot media.
Pen tip wears out quickly.	
You're using polyester film.	Polyester film has a textured surface to which ink adheres. The surface is abrasive and wears down the pen tip. The coarser the media or the higher the pen force or speed, the faster the tip will wear. Select another media type, reduce the speed and/or force of pen. If using liquid ink pens, verify that you are using tungsten tip pens.
Pen is fiber tipped.	Fiber tip pens wear faster than ballpoint or liquid ink pens. Wear is indicated by a broadening of the line on the media. To prolong fiber tip pen life, use a smooth plotting media and the lowest possible pen force.
Lines look wiggly.	
Pen tip is damaged.	Examine the pen and replace it if it looks worn or off center.
There may be a mechanical problem.	Periodic wiggles indicate fluctuations in pen pressure or pen height. See your CalComp service representative for adjustments.
Line width is not uniform.	
Liquid ink pen is dirty.	A dirty pen can work, but line width may vary. Clean the pen thoroughly.
Variations in pen speed.	Variations in pen speed create variations in line boldness. The plotter stops at the beginning of each line segment creating a bolder line on shorter line segments than on longer line segments. Lowering the pen speed may help. (See Set-Up 5, Chapter Six.)

Liquid ink pen is too fast.	Ink flow in the pen may be all right for a longer line but too fast for a curve or short line. An ink with higher viscosity may be better. Lower pen speed or use of a slow drying ink may also help.
Line width is too narrow or too wide.	
Pen tip size is too small or too wide.	Change tip size. Consult this guide or CalComp catalog for sizes available.
Pen tip is worn.	Especially on fiber/plastic tip pens, tips broaden with use. If a finer line is required, use a new pen, or switch to a ballpoint that maintains a constant width.
Your program may not be drawing enough lines.	Write a subroutine in your software, defining multiple lines spaced so closely together that they appear as one broad line.
Ink flow is uneven.	
Pen is dirty.	Pen picks up lint, especially at high speeds, and draws ragged lines. Residue in ink reservoirs can also affect ink flow. Clean the point, if this is a refillable liquid ink pen. Discard the pen if it is not.
Plotter speed is too fast for pen type.	When the speed is too high, ink flow can't keep pace. Make sure pen speed and force are optimum. If the problem persists, slow pen speed down (see Set-Up 5, Chapter Six).
Pen force is too high or low.	When pen force is high or low, the result may be lines narrower in one place than in another. Reestablish default values for force and speed by initializing plotter. (See Set-Up 14.) If the problem continues, vary the pen force until you find an optimal value.
Pen is running out of ink.	Replace the pen. When a pen begins to run out of ink, the ink flow generally decreases before completely stopping. Decreasing plotter speed may provide a smoother ink flow under these conditions. If you're using a liquid ink pen, refill ink reservoir.
Ink is too thick for pen point size.	Ink with a lot of pigmentation or particles in it can't flow through a very small point. Use a larger point size or a thinner ink.
Ink smears or does not dry.	
Ink and media are incompatible.	Fiber/plastic tip and ballpoint pens aren't compatible with polyester film or many vellums. Other combinations may also be incompatible. Check compatibility tables in Chapter Four. Problems could result from exceeding 48-inch length on mylar, ClearPlot®, or vellum.
Ink fades or separates.	
Ink may be reacting to oil in vellum.	Change the ink, or type of pen, the type of vellum, or kind of media. This problem is most evident when non-liquid ink pens are used.

Liquid ink is unstable.	Some inks break down with age. Clean the pen and use a new bottle of ink.
Ink flakes away.	
Surface of the media is contaminated.	Media surface may be covered with particles, like cleaning powder. Never treat plotting media with cleaning powder or similar drafting compounds.
Ink is unstable.	Change your pen if it is disposable; or, clean refillable pen and refill with new ink.
Plotter seems to wander or drift.	
Plotter has been bumped or media has been moved.	If the plotter is bumped during a plot, it will sometimes jar the pen, causing the plot line to misregister. An obstruction to the media's movement or slippage may also look like wandering or drifting.
Plot media movement is obstructed.	This sometimes happens if the plotter is placed too close to a wall or other object. Operate the plotter in an open area where the media can move freely.
Grit bands are clogged.	If the grit bands are dirty, the gripping mechanism won't work properly. Clean the grit wheels with a soft brush; avoid subsequent buildups by using media recommended by CalComp.
Climatic changes.	Changes in temperature or humidity during a plot can stretch or shrink the media. Let the media acclimate to the room before beginning the plot or use a more stable media.
Media is unsuitable.	Media that is too thick, too thin, or too slippery may not be gripped properly as it moves through the plotter. Avoid using slippery media, such as film.
Program has an error.	Check the program.
Plotting speed is slow.	
You're using slow pen types.	Liquid ink and some plastic tip pens are slow. To increase speed, use ballpoint pens. Also, you might try high-quality, smooth tracing bond to maintain line quality and minimize pen wear.
Your default pen speed is too slow.	Default pen speeds are established for each pen type and reflect a compromise between plot quality and highest speed. To increase the speed of the plot, change the pen speed parameters, (See Set-Up Five, Chapter Six) or change your software parameters.

Drawings reproduce poorly.

Lines are not dense enough.	Try ballpoint pens on bond to produce denser lines. Fiber/plastic tips or ballpoint tips on vellum or polyester film produce faded lines because the ink won't absorb. Liquid ink pens produce the best lines for reproduction purposes.
Plot media isn't suitable for your reproduction process.	Contact your CalComp representative to determine the best media to use.

Writing surface is rippled, torn or scratched.

Plot media is too thin.	Thin media doesn't have the tensile strength to move through rollers. Change to a heavier media.
Plot media is too thick.	Pen tips may scrape the media if it is too thick. The plotter works most effectively with bond, translucent, or vellum thinner than 0.15 mm (0.006 in.) or polyester film no thicker than 0.1 mm (0.004 in.).
Plot media is uneven.	The media may be warped or uneven, causing the media to tear or scrape at high speeds. Check the media carefully and replace it if this problem is detected.
Pen force is too high.	Too much pen force may scratch the media. If this problem is detected, select a lower pen force (see Set-Up 5) or reinitialize the plotter (see Set-Up 14).
Pen tip is damaged.	Check the pen tip. If it is damaged, replace it.
Pen is too close to the surface.	The plotter has an automatic pen height adjustment mechanism. If the pen tip is too close to the surface, this means either the media is thicker than acceptable for the plotter, or the height mechanism is out of order. If the latter condition exists, contact your CalComp service representative.
Plot media is improperly loaded.	If this condition is detected, reload the sheet. Make sure the media has square corners, is against the paper stops, is correctly under the pinch rollers, and is properly aligned with the front quide mark. (See Chapters One and Three)
Ink has soaked the plot media.	If many closely spaced lines are drawn on a fiber-based paper, the media may become damp and weak. Further drawing in the same area can tear the media. Change the plotting conditions so that the ink will have time to dry before more lines are drawn in the same area (Try turning OFF the Plot Manager in Set-Up 16.)

Media is skewing.

Media is too thick.	Check to see if the media is thicker than 5 mil. If it is, change it to under 5 mil, but greater than 2 mil.

Media is too wide.	If the media is wider than 28 inches and not on both grit rings, use the appropriate optional grit drum. For non standard size media between 24 inches and 28 inches wide, it may be necessary to plot at reduced speed and acceleration.
Media is not properly aligned.	Reload your paper and check to see if the media has been lined up with the front platen margin. If the paper won't align properly after you've double checked the loading, check to see if the paper is approximately square. If the corners of your cut sheet paper are more than two or three degrees deviation from square, then change your paper.

Media drops on floor.

Corners are not square.	One or more pinch rollers lose their grip if the paper is extended to its full length when the corners are not right angles. Trim the ends of media carefully.
Pinch rollers are up.	Make sure pinch rollers are down before proceeding with any plot.
Paper sensors need cleaning.	If chad or dust particles accumulate on paper sensors, the plot media may not be sensed and may drop onto the floor. Wipe off the sensors using a dry cloth or cotton swab.

Media hits the plotter as it moves back and forth.

Sheet media has been rolled.	Any curl in the media causes it to hit the back of the plotter. Flatten the media so that it won't curl.

Roll media gets jammed in the plotter.

Use of media width more than 36.2 inches.	Always observe specifications. Don't use media wider than 36.2 inches or particularly when either the humidity or the temperature exceeds CalComp standards.
Plotter is operating outside environmental limits.	Observe specifications. Limits are 40 to 60 percent relative humidity and 15 to 35 degrees Celsius.
Media is wrinkled or creased.	Cut off damaged media and reload. Observe all instructions.

Lines at beginning and end of plot do not match.

Media expansion during plot has caused wavering.	Use polyester film if expansion is a problem.
Plotter is operating outside environmental limits.	Observe environmental specifications.

Pen draws outside of margin or off the media.

Your media is too narrow for your plot.	Recalibrate your plot to accommodate the width of the paper you're using or replace drum with larger one.

Media width isn't correctly listed in the parameters.	Media type parameters should correspond to those listed in Set-Up 10 (Chapter Six).
Paper sensor is dirty.	If the paper sensors can't read the media margins, then the media will fail to load. Clean the sensors with dry cloth or cotton swab.

Y axis crash occurred while loading media.

Carriage had been moved too far right before loading.	Move the carriage to the center of the beam before powering up. The firmware will position the carriage slightly more than 3 inches to the left of the right pinch roller at an Unload routine only. It assumes all paper loading starts from that point.

RUN-TIME DIAGNOSTIC MESSAGES

Introduction

The following chart shows the Error Display Message, with an explanation of the message and the recommended corrective operation action. If after following the recommended solution the error is not corrected see the information at end of this chapter, Calling For Assistance.

During each power-on sequence and while the plotter is operating, the internal run-time diagnostics, automatically monitor the major functions of the plotter. Failure of any of these automatic checks cause the ALERT indicator to light, and an error message to appear on the message display. If a plot is in progress, plotting stops until the error condition is cleared.

If it is necessary for you to use the RESET key to clear an error condition, make absolutely certain that you understand all of the consequences before you press the key. See the information for the plotter Reset feature located in Chapter Six for assistance.

Error Message Chart:

Display Message	Explanation	Operator Action
ROMpack Checksum Error	EEPROM checksum failure during system initialization	Power-off, then on. If error recurs, call CalComp service.
Logic Board RAM READ, WRITE ERROR	Reading or writing to RAM Failed	Power-off, then on. If error recurs, call CalComp service.
CRASH condition; (*) Please RESET * data field can be .x, -x, .y, -y	Failure of XY servo during operation	Press RESET key and start plotting again. If error recurs, call CalComp service.
Illegal Pen Number Fatal Error, RESET	Illegal pen selected via online command from host	Repeat plot and check for same error in same area of plot. If error recurs, check plot data.

LOGIC ERROR Fatal error, RESET	Illegal command received from host while plotting in 960 Mode	Repeat plot and check for same error in same area of plot. If error recurs, check plot data.
Trans error = N Fatal error, RESET	N values are: F = Framing error received character not as expected O = Overrun (input speed of buffer exceeded) P = Parity error (bit drop-out within character frame) B = Buffer overflow (buffer not appended within limits)	Repeat plot and observe for same error in same area of plot; if error recurs, check plot data. If possible, try difference source and check for repeatability of error.
Checksum error Fatal error, RESET	Checksum character in host data record does not match checksum character calculated by plotter.	Rerun job and check data source. If recurs, call CalComp service.
Index mark out of alignment. Hit RESET	Failure in pen turret initialization.	With power on, remove, manually rotate to different position and reinstall turret. The index sensor is out of alignment and service is required.
INV = xx yyyy zzzzz UNRECOVERABLE ERROR	Fatal system error: xx = vector number yyy = processor status zzzzz = program counter	Power-off, then on. Try to rerun the plot. If error recurs, record xx, yy, zz values for service engineer's reference and call CalComp service.
EEROM write error Press RESET	Error writing to EEPROM that usually indicates a defective nonvolatile memory.	Switch to a different user number. If error recurs, call CalComp service.
User Default Setup Entered Data Lost	Error reading data from EEPROM that generally indicates a defective non-volatile memory.	Try a different user number. If error recurs, call CalComp service.
Default Configuration Entered data lost	Error reading data from EEPROM which usually indicates defective nonvolatile memory.	Switch to a different user number. If error recurs, call CalComp service.
Invalid User Number Default to User #1	Invalid user number has been read from EEPROM	Try a different user number. If error recurs, call CalComp service.

Install TURRET RESET when Corrected	Attempt to initialize turret with no turret installed.	Install turret or if no turret is to be used, manually install pen in pen selector arm. Press RESET key. If message recurs remove turret and check reflective strip at side of pen position 6 on turret for dirt, dried ink, etc. Clean surface if necessary, and reinstall turret. Press RESET. If message recurs, call CalComp service.
Voice Coil Problem RESET when Corrected	Plotter is unable to lower penholder to turn turret. Either the voice coil path is obstructed or the voice coil is not actuating.	Remove turret and observe pen selector arm for full up position on initialization. Manually rotate turret to a different position and reinstall turret on plotter. Press RESET. If problem persists, call CalComp service.
Error getting pen from turret RESET Error putting pen in turret. Fix RESET	Plotter is unable to get or replace pen in turret because of improper synchronization between turret pen station and the selector arm. Plotter will do six retries before error.	Remove, manually rotate and reinstall turret in different position. Press RESET. If error persists, call CalComp service
Index Not Found Reset when Correct	Plotter did not sense the reflective index strip on the side of the turret at pen position 6. This is sometimes caused by the pen's being slightly misseated in position 6.	Remove, manually rotate, and reinstall turret. Install a pen in pen position 6 if none is there, or try a different pen in that position if a pen is installed. Press RESET key to continue program.
No paper in path	Plotter did not sense any media when LOAD key was pressed.	Make sure media is properly installed along media path. If using vacuum cannister, verify that media dips into cannister about halfway. If using roll media, verify that media is attached to the take-up core. If media being used is transparent, the paper sensors will not operate properly. Install a more opaque media.
Please Replace Pen RESET when correct	Plotter was unable to put pen away during turret initialization.	Remove, manually rotate, and reinstall turret. Remove and replace pen that was in selector arm at time of initialization. Press RESET key.

PE00 PARSE CMD ERR PE01 SYMBOL CMD ERR PE02 EXT CHR CMD ER PE03 DELTA CMD ERR PE04 DELTA TOO LARG PE05 SYM SCL TOO LR PE06 ILGL SYMBL CHR PE07 UDS UNSELECTD PE08 OFST PRS OVRF PE09 UNERASABLE SY PE10 UDS LD CNT PE11 UDS LD ADR PE12 ARC CIR CMD PE13 DSHLN CMD PE14 DIR CMD PE15 DIR SEQ PE16 EPP CMD PE17 PLOT FIFO PE18 MULTI CHAR EOB PE19 ILGL SETIO	These are all two-line parser errors that occur when plotting in PCI Mode. They are due to illegal commands from host being decoded by the plotter. These parser errors equate to logic errors when plotting in 960 Mode. The second line on the display contains (in Hex) the commands causing the particular error. The second line is not shown in this chart as the characters differ in each command.	Repeat plot and check for same error in same area of the plot. If error recurs, you must record the hex characters from the second line of the message to help the field service engineer in diagnosing the problem. Hold joystick to the right or press right arrow key to access the entire character string to the right. When the message stops scrolling, move the joystick left or press left arrow key to access the balance of the message to the left. When the display ceases scrolling, all involved hex characters within the erroneous command will have been revealed. Call CalComp service to report problem.
No pens in turret RESET when correct	This error message displays when the plotter attempts to select a pen from the turret but no pens are installed.	Try one of these methods: Install pens in turret (a minimum of 1). Press RESET key. If pens are already installed, replace the pen located in the pen select position with new pen. Press RESET key. Raise and lower the safety cover to reinitialize the plotter. If implementing these methods does not clear the error message, call CalComp service.
Fatal seek error	This error message should only occur when you are plotting in Cut Sheet Mode. The plotter is not able to detect the media edges within the allowable limits at initialization.	Try a different sheet of media. If problems persist, call CalComp service.

Paper is not wide enough! Proceed Y/N	The 1044 plotter has discovered in seeking media edge that the installed paper is less than the 36-inch width called for in the program. This message will also appear if you have moved the left pinch roller too far to the right to clear the sprocket pins.	Check paper supply for proper width. Move left pinch roller a little further to the left but leave enough space to clear the pins. If you press the YES key telling the plotter to proceed with the job at hand, the left edge of the plot will be clipped. If you answer NO to the PROCEED query, the plotter will stop until you have corrected the pinch roller or paper width problem. Once this is done, press the LOAD key and the plotter is ready.
Paper Out Detected Please Press RESET'	The 1044 plotter has depleted the roll media during operation.	Install a new supply of media. If this does not clear the display, there is a sensor problem. Call CalComp service.
Previous Plot in progress	Attempt to start second Demo Plot before completing or clearing the first.	Complete or clear initial Demo Plot by pressing NEW PLOT and YES keys.
IMD already in effect	Attempt to enter the Input Monitor Dump (IMD) Mode while already in IMD Mode.	Clear second IMD command. To exit this test, press RESET and YES keys.

PLOTTER TEST ROUTINES

Introduction

The Plotter Test routine is accessed similar to accessing the set-up routine. The SAVE/TEST key is pressed and the keyboard numeric key 0 is used to address the Demo Plot test menu item.

Test 0, The Demo Plot

The Demo Plot is a self-contained internal plot program that can be used to test plotter response to plot commands and is also used for such functions as calibrating the drum for scale factor compensation. (See Set-Up 13.)

The Demo Plot is a short duration test, that is especially desirable to use as a quick simulation for fault isolation. The completed Demo Plot is shown in Chapter 1, Figure 1-19.

PREREQUISITE TO RUNNING THE DEMO PLOT

Make sure the plotter is in Manual Mode with the AUTO indicator light off. The message display will depend on plotter status. It is assumed that you have already completed the following:

- Turned on the power to the plotter and successfully completed a power-on routine.
- Loaded pens into the turret and loaded the turret.
- Loaded the media.
- Closed the safety cover.
- Verified that you are in the correct user memory location.
- Rotation, Set-Up 1, is set to 0 degrees of rotation. The Demo Plot will not run in any rotate position except 0. If you had a rotate value set in, the Demo Plot would automatically still plot at 0 degrees.
- Media Type, Set-Up 10, is set to media being used.
- Scale Factor, Set-Up 13, is set to correspond to the installed drum.
- Language Display, Set-Up 15, is set to meet your plotting requirements.
- Plot Management, Set-Up 16, is disabled. This is not an absolute requirement. The Demo Plot will run with plot management enabled, but with it disabled, and if you are trying to run the Demo Plot for fault isolation you have one less factor to be concerned about.

Display:

Ready
Press AUTO to Plot

To Access the Test Routine

1. Press the TEST key.

   Display:

   Routine Number:
   Press NEXT for Menu

2. Select the Demo Plot Test 0.

   - You may scroll to the test by pressing the NEXT or Prior keys until the message reads:

     Display:

     Routine Number:
     0 Demo Plot

     -------OR------

   - You may directly select the Demo Plot Test 0 by pressing the 0 keyboard numeric key.

3. After either of the two methods, press the ENTER key and the message will display the prompt:

   Display:

   Demo Plot
   Press AUTO to Plot

4. Press the ENTER key and the Demo Plot will be ready to commence plotting.

5. Press the AUTO key and the Demo Plot will commence plotting.

   - While the Demo Plot is running the display reads:

     Display:

     Auto Time:
     Plot Time:

     (Value displayed will be actual time.)

   - When the Demo Plot is completed the display will read:

     Display:

     Demo Plot
     Is Finished

To Exit the Test Routine

If you wish to rerun the Demo Plot, reposition the point of origin and repeat steps 4 and 5. If you wish to discontinue, pressing the AUTO/MANUAL key will return you to a ready condition.

PREVENTIVE MAINTENANCE

Introduction

The CalComp 1040GT Series plotters requires only a minimal preventive maintenance procedure. All moving and rotating parts subject to mechanical wear are factory prelubricated. If any mechanical or electrical part should need to be replaced, it should only be done by an authorized CalComp service representative. This obviously does not include such items as the pen turret and drums that are operator serviceable.

Your maintenance responsibilities consist of routine inspections, basic good housekeeping cleaning, and plotter performance checkouts. It is a good practice to establish a regular schedule for these tasks. The frequency of the task will depend on your plotting applications and your plotting environment. For most applications cleaning daily and inspections/checkout once a week until you establish your own routine is a good starting place.

CAUTION

The CalComp 1040GT Series plotters are a rotary electrical-mechanical device that deserve the respect all devices of this nature require. You should never try to bypass any interlocks or sensing devices. When cleaning or inspecting this device you should always turn OFF the power before beginning your procedure.

Inspection

Periodically inspect the plotter for wear, loose nuts, screws or springs, and any accumulation of dust, dirt or paper chad on exposed working parts or drum's grit banks.

Cleaning

Clean the plotter at regular intervals. Use a lint free cloth dampened very lightly with warm water. To prevent damage to the cabinet finish or the control panel, never use a strong or caustic cleaning fluid or compound.

CAUTION

Do not use acetone, lighter fluid, carbon tetrachloride, trichlorethylene, or a related cleaner. Do not use any form of spray cleaner on the plotter, unwanted residue can remain within the rotating or electronic component parts of the machine.

- Wipe dust and dirt from the safety cover and keep it closed when the plotter is not in use.
- Paper chad builds up on the grit bands on either side of the drum. Use a stiff bristle brush (such as a toothbrush) to dislodge and remove the chad.
- Remove all dust, chad and dirt from the media plot area. Use a lint-free cloth dampened very slightly with warm water and clean the drum, platen, pinch rollers, idler rollers and vacuum canisters. Do not let debris fall into the plotter mechanism.
- Remove the pen turret and inspect the pen caps. Where necessary, remove the pen caps and clean them in warm, soapy water. Rinse and dry the caps thoroughly before putting them back in the turret. An ultrasonic cleaner may be used to clean the pen caps. Worn and cracked caps should be replaced, ensure that the correct type caps go back into the correct pen positions.
- Remove any buildup of ink residue on the pen guide. Clean the pen guide with a cotton swab that has been slightly dampened with water.
- Use a dry cloth or cotton swab to clean all sensor openings.

Performance Checkout

A very helpful feature in assisting you in the operational analysis of your plotting system is the internally available Demo Plot that is a short duration test. This makes it especially desirable to use as a quick simulation for performance checkout. This plot is a part of the ROMPACK firmware program and can be run independently of any host computer. This can be useful in isolating a suspected problem between the host and its plot program and the plotter.

You might find it advantageous to retain an acceptable quality Demo Plot for later comparison with a freshly run Demo Plot if you suspect a degradation of plot quality.

See the information for Plotter Test Routines in this chapter for assistance in running the Demo Plot.

CALL FOR ASSISTANCE — 1-800 CALCOMP

Introduction

Assistance is provided by CalComp, either from the authorized CalComp Service office in your area or from a HOT LINE service. Which one you call obviously will depend on the nature of your assistance requirements.

Whom To Call

If you have a known mechanical failure, something is loose or broken, the service office is the most probable place to call. If you have a technical or operational question, the HOT LINE is the most probable calling place.

Prerequisite

Regardless of whom you call, CalComp will need some informational answers to adequately respond to your questions. Please be prepared to answer the following questions about your graphic system.

- Your name and plotter location
- Plotter Model Number
- Plotter Serial Number
- ROMPACK firmware revision
- The host computer or driving controller to which your plotter is attached
- Graphic Application
- Software being used
- Media, pens and ink being used
- Nature of problem or question

CHAPTER EIGHT
ACCESSORY AND OPTION SUPPLIES

INTRODUCTION

CalComp offers accessories and options to complement your plotting requirements. In addition, CalComp also offers a wide assortment of pens, inks and media to add to your plotting versatility. This chapter includes the information for all of the standard and optional accessory supplies available with your 1040GT Series plotter.

1. Standard Media Width Supplied Drums (1042GT, 1043GT and 1044GT) (See Table 8-1.)

   - Standard 36-Inch Wide Grit Drum (1042GT, 1043GT and 1044GT)
   - Standard 36-Inch Wide Sprocket Drum (1044GT)

2. Optional Media Width Grit Drums for Cut Sheet Media (1042GT, 1043GT and 1044GT)

   - Optional Width Grit Drum with 22-Inch Spacing
   - Optional Width Grit Drum with 23.4-Inch Spacing
   - Optional Width Grit Drum with 24-Inch Spacing
   - Optional Width Grit Drum with 28-Inch Spacing
   - Optional Width Grit Drum with 30-Inch Spacing
   - Optional Width Grit Drum with 33.1-Inch Spacing
   - Optional Width Grit Drum with 34-Inch Spacing

3. Optional Narrow Media Adapter Kits (1042GT, 1044GT)

   - Optional Kit with 15.4-Inch Grit Drum and Mandrels (1042GT)
   - Optional Kit with 15.4-Inch Sprocket Drum, Mandrels and Vacuum Cannister Baffles (1044GT)

4. Media Applications and Compatibility

   - Maximum Plot Dimensions Chart (See Table 8-2.)
   - Compatibility Chart For All Media Applications (See Table 8-3.)

5. Pen and Ink Accessories Listing (See Table 8-4.)

   - Standard Pens Included with Plotter (See Table 8-5.)
   - Optional Premium Pen Kit (See Table 8-6.)
   - Media Supplies Listing (See Table 8-7.)
   - Pen Supplies Listing (See Table 8-8.)

STANDARD DRUMS

The standard drums supplied by CalComp and shipped with your plotter are dependent upon your plotter model.

1. Standard Media Width Supplied Drums (1042GT, 1043GT and 1044GT)

    - Standard 36-Inch Wide Grit Drum (1042GT, 1043GT and 1044GT)
    - Standard 36-Inch Wide Sprocket Drum (1044GT)

Model 1042GT is a dual-mode plotter. It operates in both the Cut Sheet and Roll Feed Mode, using the same drum for both applications.

Model 1043GT is a cut-sheet plotter which does not have the capability of operating in Roll Feed Mode.

The 1042GT and 1043GT have the capability of accepting optional width drums for narrower media applications.

Model 1044GT is also a dual-mode plotter, however, it operates in both the Cut Sheet Mode with a grit drum, and the Roll Feed Mode with a sprocket drum. When you first receive your plotter, the sprocket drum is installed in the plotter, and the grit drum is stored in a special protective container. Whichever drum is not in use should always be stored in this protective container.

Remember, each drum has its own physical characteristics and calibrated size that must be entered into the plotter memory as scale factor before plotting can begin. See Chapter Six, Set-Up 13 for assistance.

When changing from roll feed media to cut sheet media mode of operation and vice versa, you must always change the Media Type Selection, Set-Up 10, to correspond to the media being used. See Chapter Six for assistance.

The plotter model applications and plotting media compatibility of each of the drums is summarized on Table 8-2, Maximum Plot Dimensions Chart and Table 8-3, Compatibility Chart For All Media Applications. Optional Drums and Narrow Media Adapter Kits are also summarized on these two tables.

TABLE 8-1. DRUM CONFIGURATIONS

	GRIT DRUMS									SPROCKETED DRUMS	
Drum Number	22	23.4	24	28	30	33	34	36	15	36S	15S
Media Width	22	23.4	21	28I	30	33.1	34	36	15.4	36.7	15.4
1042GT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	Opt.	N/A	N/A
1043GT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	N/A	N/A	N/A
1044GT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	N/A	Std.	Opt.

OPTIONAL MEDIA WIDTH GRIT DRUMS FOR CUT SHEET MEDIA

The standard grit drum shipped with the 1040GT Series plotter models 1043GT and 1044GT are designed to accommodate 36-inch-wide media.

For ANSI or ISO Cut Sheet Mode operation of media less than 28-inches wide, the plotter will maintain proper allignment with only the right edge of the media held between the right pinch roller and the grit band. The left edge of this media will be held between the left pinch roller and the drum surface. For non standard size media between 24 inches and 28 inches wide, it may be necessary to plot at reduced speed and acceleration. However, when using media sizes wider than 28 inches, and to maintain proper alignment, both the left and right edges of the media must be held between the pinch roller and the grit bands. Therefore, if you are using cut sheet media wider than 28 inches, but less than 36 inches you must use one of the optional available drums listed below.

1. Optional Media Width Grit Drums for Cut Sheet Media (1042GT, 1043GT and 1044GT)

- Optional Width Grit Drum with 22-Inch Spacing
- Optional Width Grit Drum with 23.4-Inch Spacing
- Optional Width Grit Drum with 24-Inch Spacing
- Optional Width Grit Drum with 28-Inch Spacing
- Optional Width Grit Drum with 30-Inch Spacing
- Optional Width Grit Drum with 33.1-Inch Spacing
- Optional Width Grit Drum with 34-Inch Spacing

These drums are specially designed drums to accommodate your special plotting requirements. They are built on the standard 36-inch drum frame and physically fit in place of the standard drum. They have the left grit band permanently spaced at the specified distance from the right grit band.

These drums are user-installable. The procedure for drum installation is described in Chapter Three. Remember, each drum has its own physical characteristics and calibrated size that must be entered into the plotter memory as scale factor before plotting can begin. See Chapter Six, Set-Up 13 for assistance.

When changing from roll feed media to cut sheet media mode of operation and vice versa, you must always change the Media Type Selection, Set-Up 10, to correspond to the media being used. See Chapter Six for assistance.

The plotter model applications and plotting media compatibility of each of the drums is summarized on Table 8-2, Maximum Plot Dimensions Chart and Table 8-3, Compatibility Chart For All Media Applications. Optional Drums and Narrow Media Adapter Kits are also summarized on these two tables.

OPTIONAL NARROW MEDIA ADAPTER KITS FOR 15.4-INCH ROLL FEED MEDIA

Both Narrow Media Adapter Kits are for 15.4-inch-wide roll feed media. The 1042GT adapter kit is used for unpunched roll media only, and the 1044GT adapter kit is used for punched roll media only.

- Optional Narrow Media Adapter Kits (1042GT, 1044GT)
- Optional Kit with 15-Inch Grit Drum and Mandrels (1042GT)
- Optional Kit with 15-Inch Sprocket Drum, Mandrels and Vacuum Cannister Baffles (1044GT)

Both kits in addition to containing a replacement drum also contain a set of mandrels that serve as spacer compensation adapter to make up for the difference between the standard 36-inch feed and take-up roll and the 15.4-inch-wide rolls.

In addition, the adapter kit for the 1044GT also contains a set of vacuum cannister baffles that serve to reduce the volume of the vacuum cannisters when the narrow media is used.

These adapter kits are user-installable. The procedure for installation of either kit is described in Chapter Three. Remember, each drum has its own physical characteristics and calibrated size that must be entered into the plotter memory as scale factor before plotting can begin. See Chapter Six, Set-Up 13 for assistance.

The plotter model applications and plotting media compatibility of each of the drums is summarized on Table 8-2. Maximum Plot Dimensions Chart, and Table 8-3. Compatibility Chart For All Media Applications. Optional Drums and Narrow Media Adapter Kits are also summarized on these two tables.

The maximum plot length of the 1042GT in Roll Mode is 50 inches, However, when the narrow media adapter kit is installed this maximum plot length is changed to 36 inches.

When the Narrow Media Adapter Kits are installed you must change the Media Type Selection, Set-Up 10, to 15-inch roll. Remember to return the selection to another media type when you remove these adapter kits.

MEDIA APPLICATIONS AND COMPATIBILITY

CalComp offers a wide range of different media to meet your plotting applications. Chapter Four of this User's Guide provides a detailed description of the different media available.

This chapter, with information contained in Tables 8-2 and 8-3, provides a summary of the plotter models and media type compatibility.

NOTE:

Do not confuse the terms punched and perforated media. Punched media refers to media with holes punched on each side of the media to fit on the sprockets of the sprocket drum. Unpunched media refers to media that is made to be used with grit ring drums and may or may not be perforated. Perforated media refers to media that has a perforated tear line, usually along both sides. It is not uncommon for some types of roll media to be both punched and perforated which is similar to what you might see with some types of fanfolded line printer paper.

E-Size Drawings

While drum number 34 (Table 8-2) accommodates an ANSI E-size sheet, the actual plot width is 32.4 inches compared with the standard ANSI E-size width of 33.0 inches. If a plot must be closer to the drawing borders than 0.3 inches, a number 36 drum and 36-inch-wide media should be used. CalComp offers a variety of 36-inch-wide media. Some have perforations 34 inches apart for E-size applications.

Roll Feed Media (1042GT)

For model 1042GT, series 900 unpunched roll feed media is available in 36.7-inch and 15.4-inch widths. Translucent, vellum, and polyester film are available. Translucent and vellum have perforations, but the polyester film has none. The 36.7-inch wide media has 34-inch wide perforations while the 15.4-inch media has 11.0- and 11.7-inch-wide perforations. Maximum plot length is 50 inches with the 36.7-inch and 36 inches with the 15.4-inch media. Maximum plot length is up to 50 inches on the 1042GT and 100 ft. on the 1044GT with paper and liquid ball pens. Plot length is limited to 4 ft. on clear film, polyester film and vellum with disposable and refillable liquid ink pens.

Roll Feed Media (1044GT)

For model 1044GT, series 500 and 600 roll feed media with punched holes for sprocket drums is available in 36.7-inch and 15.4-inch widths. Polyester film and ClearPlot® do not have perforations. All other 36.7-inch-wide media have perforations 34 inches apart. Maximum plot length is the 100-foot roll for types of punched roll feed media. Maximum plot length is up to 50 inches on the 1042GT and 100 ft. on the 1044GT with paper and liquid ball pens. Plot length is limited to 4 ft. on clear film, polyester film and vellum with disposable and refillable liquid ink pens.

TABLE 8-2. MAXIMUM PLOT DIMENSIONS

MODEL	MEDIA			
	CUT SHEET		ROLL	
	MAX MEDIA SIZE IN MM	MAX PLOT AREA IN MM	MAX MEDIA SIZE IN MM	MAX PLOT AREA IN MM
1042GT	36×49 914×1245	34×47.4 864×1204	36.7×120 FT 932×36.6 M	34×48 864×1220
1043GT	36×49 914×1245	34×47.4 864×1204	— —	— —
1044GT	36×49 914×1245	34×47.4 864×1204	36.7×120 FT 932×36.6 M	34×48 864×1220
1042GT +NARROW PAPER ADAPTER KIT	— —	— —	15.4×120 FT 391×36.6 M	13.2×36 335×914
1044GT +NARROW PAPER ADAPTER KIT	— —	— —	15.4×120 FT 391×36.6 M	13.2×36 335×914

NOTE

Maximum plot dimensions for any plotter and media combination are the smallest of the following:

- *0.8 inches/20 mm short of each media edge*
  or
- *Distance between media perforations*
  or
- *Maximum plot dimensions using maximum size media as shown above*

TABLE 8-3. COMPATIBILITY CHART FOR ALL MEDIA APPLICATIONS

	CalComp Media Description	Media Size		Perf. Width[1]		Drum No. Required[2]	Plotter			Max. Plot Width by 1040GT[1,3]		Max. Plot Length by1040GT[4]	
		mm	inch	mm	inch		1042GT	1043GT	1044GT	mm	inch	mm	inch
CUT SHEET	D900 Polyester Film	559×864	22×34	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	518	20.4	823	32.4
	E900 Polyester Film	864×1118	34×44	—	—	34	X	X	X	823	32.4[3]	1077	42.4
	E700 Gloss	864×1118	34×44	—	—	36	X	X	X	823	32.4	1077	42.4
	E300-P Vellum 1411	914×1118	36×44	864	34	36	X	X	X	864	34	1077	42.4
	E600-P 22# Bond	914×1118	36×44	864	34	36	X	X	X	864	34	1077	42.4
	ANSI E	864×1118	34×44	—	—	34	X	X	X	823	32.4[5]	1077	42.4
	ISO A0	841×1189	33.1×46.8	—	—	33	X	X	X	800	31.5	1148	45.2
	ARCH F	762×1067	30×42	—	—	30	X	X	X	721	28.4	1026	40.4
	ANSI F	711×1016	28×40	—	—	28	X	X	X	671	26.4[5]	975	38.4[5]
	ANSI D	559×864	22×34	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	518	20.4	823	32.4[5]
	ISO A1	594×841	23.4×33.1	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	554	21.8	800	31.5
	ANSI A-C	[6]	[6]	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	[3]	[3]	[4]	[4]
	ISO A4-A1	[6]	[6]	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	[3]	[3]	[4]	[4]
	D200-P Translucent	635×864	25×34	559	22	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	559	22	823	32.4[4]
	D300-P Vellum 1411	635×864	25×34	559	22	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	559	22	823	32.4[4]
	D600-P 22# Bond	635×864	25×34	559	22	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	559	22	823	32.4[4]
	A100 ClearPlot®	216×279	8.5×11	—	—	22, 23.4, 24, 28, 30, 33, 34, 36	X	X	X	175	6.9[3]	239	9.4[4]
ROLL	Non-Punched												
	900-37	932	36.7	864	34	36	X			864	34	1270	50
	900-15	391	15.4	279	11	15	X			279	11	914	36
	900-15M (Metric)	391	15.4	297	11.7	15	X			297	11.7	914	36
	Punched												
	500	932	36.7	864	34	36S			X	864	34	30.5M	100FT
	600	391	15.4	279	11	15S			X	279	11	914	36
	600M (Metric)	391	15.4	297	11.7	15S			X	297	11.7	914	36

[1]Polyester film, ClearPlot® and gloss are not perforated.
[2]Pertains to models 1042GT, 1043GT, 1044GT only.
[3]Maximum plot width is 34 in/864 mm, or 0.8 in/20 mm short of each media edge, or perforation width, whichever is least.
[4]Maximum plot length is 48 in/1220 mm, or 0.8 in/20 mm short of each media edge, whichever is less.
(With narrow paper adapter kit, maximum plot length is 36 in)
[5]Border limitations keep maximum dimension less than ANSI standard (0.6 in less for ANSI D, E & F).
[6]See ANSI ISO Standards Table

PEN AND INK ACCESSORIES LISTING

TABLE 8-4. PEN AND INK ACCESSORIES LISTINGS

DESCRIPTION
LIQUID INK PEN ADAPTER ASSEMBLY I/C 642190-3
LIQUID INK PEN TIP CAPS I/C 643430-2 (USE TO CAP PEN TIPS WHEN NOT IN USE ON PLOTTER)
LIQUID INK PEN CAPS (BLACK) FOR PEN TURRET, 12 CAPS/PKG I/C 649420-7 (USE WITH LIQUID INK PENS; WL, 7L AND 7T SERIES PENS)
STANDARD PEN CAPS (BEIGE) FOR PEN TURRET, 12 CAPS/PKG. I/C 649410-8 (USE WITH ALL OTHER PEN TYPES; WB, WPP AND WFP SERIES PENS)
RETICLE I/C 654880-4
CONCENTRICITY WRENCH I/C 657350-5 (USE TO INSERT LIQUID INK TIPS INTO THE LIQUID INK PEN ADAPTER)
ULTRASONIC CLEANER I/C 303620-9
ULTRASONIC CLEANER CONCENTRATE (8 OZ. BOTTLE) I/C 472340-9
PREMIUM PEN KIT I/C 649900-8

TABLE 8-5. STANDARD PENS INCLUDED WITH PLOTTER

ITEM	QTY	DESCRIPTION
1	1 Each	WLB - RED
2	1 Each	WLB - BLACK
3	1 Each	WLB - BLUE
4	1 Each	WLB - GREEN
5	1 Each	WPP - RED
6	1 Each	WPP - BLACK
7	1 Each	WPP - BLUE
8	1 Each	WPP - GREEN
9	1 Each	WFP - RED
10	1 Each	WFP - BLACK
11	1 Each	WFP - BLUE
12	1 Each	WFP - GREEN
13	2 Each	WL3 - BLACK
14	2 Each	WL4 - BLACK
15	1 Pkg.	BLACK LIQUID INK PEN CAPS

The 8 pens included with the plotter, is not a kit. The pens are included in 4 pen/packages as loose equipment.

TABLE 8-6. OPTIONAL PREMIUM PEN KIT

PREMIUM PEN KIT P/N 20350-101-000 I/C 649900-8		
ITEM	**QTY**	**DESCRIPTION**
1	1	IDENTIFICATION PLATE
2	1	PEN KIT CASE
3	1	CONCENTRICITY WRENCH
4	1	7T-3 TUNGSTEN PEN TIP
5	1	7T-4 TUNGSTEN PEN TIP
6	1	7T-5 TUNGSTEN PEN TIP
7	1	7T-6 TUNGSTEN PEN TIP
8	1	7L-6 STAINLESS STEEL PEN TIP
9	1	7L-5 STAINLESS STEEL PEN TIP
10	1	7L-4 STAINLESS STEEL PEN TIP
11	1	7L-3 STAINLESS STEEL PEN TIP
12	12	STANDARD PEN CAPS
13	12	LIQUID INK PEN CAPS
14	1	WLB-BLUE LIQUID BALL PEN
15	1	WLB-RED LIQUID BALL PEN
16	1	WLB-GREEN LIQUID BALL PEN
17	5	WLB-BLACK LIQUID BALL PEN
18	1	WPP-BLACK PLASTIC PEN
19	1	WPP-BLUE PLASTIC PEN
20	1	WPP-GREEN PLASTIC PEN
21	1	WPP-RED PLASTIC PEN
22	1	WFP-BLACK FIBER PEN
23	1	WFP-BLUE FIBER PEN
24	1	WFP-GREEN FIBER PEN
25	1	WFP-RED FIBER PEN
26	1	WL3-BLACK DISPOSABLE LIQUID INK
27	1	WL3-BLUE DISPOSABLE LIQUID INK
28	1	WL3-GREEN DISPOSABLE LIQUID INK
29	1	WL3-BLACK DISPOSABLE LIQUID INK
30	1	WL4-BLACK DISPOSABLE LIQUID INK
31	1	WL4-BLACK DISPOSABLE LIQUID INK
32	1	WL4-BLUE DISPOSABLE LIQUID INK
33	1	WL4-RED DISPOSABLE LIQUID INK
34	1	CUT ZIT
35	1	PAPER CUTTER
36	1	RETICLE
37	4	CONVENTIONAL LIQUID INK ADAPTERS
38	1	STYRENE VIAL
39	10	PIPE CLEANERS FOR LIQUID INK PENS
40	20	Q-TIPS
41	1	CLEANING BASKETS FOR LIQUID INK PENS
42	1	CLEANER SOLUTION
43	1	SYRINGE BULB FOR LIQUID INK PENS
44	1	Z-4 GREEN INK
45	1	Z-3 RED INK
46	1	Z-2 BLUE INK
47	1	IGP-1 BLACK INK

TABLE 8-7. MEDIA SUPPLIES LISTING

PLOTTER	SERIES	DESCRIPTION
1042 1042GT	900-37	36.7 in/932 mm nonpunched rolls perforated for 34 in/ 864 mm plots. Available in translucent, vellum 1411 and polyester film.*
	900-15	15.4 in/391 mm nonpunched rolls perforated for 11 in/ 279 mm plots. Available in translucent, vellum 1411 and polyester film.*
	900-15M	15.4 in/391 mm nonpunched rolls perforated for 11.7 in/ 297 mm ISO standard plots. Available in translucent, vellum 1411 and polyester film.*
1044 1044GT	500	36.7 in/932 mm punched rolls perforated for 34 in/864 mm plots, for continuous plotting. Available in translucent, 22# bond, 100% rag, vellum E, vellum 1411, polyester film and ClearPlot®.
	600	15.4 in/391 mm punched rolls perforated for 11 in/279 mm plots, for continuous plotting. Available in translucent, 100% rag, vellum E, vellum 1411 and polyester film.
1042 1042GT 1043 1043GT 1044 1044GT	**PERFORATED SHEETS**	
	E600-P 22# Bond E300-P Vellum 1411	36 in × 44 in/914 mm × 1118 mm sheets perforated for 34 in/864 mm plots.
	D600-P 22# Bond D200-P Translucent D300-P Vellum 1411	25 in × 34 in/635 mm × 864 mm sheets perforated for 22 in/559 mm plots.
	NONPERFORATED SHEETS	
	Refer to Pages 3 and 4 of the CalComp 1020 and 1040 Series Pen Plotters Graphic Supplies Guide for nonperforated cut sheet offering	

TABLE 8-8. PEN SUPPLIES LISTING

TYPE	PRODUCT CODE	USAGE/CHARACTERISTICS
Fiber Tip	**WFP** Series Broad .025 in/.64 mm	Inexpensive and disposable. Vivid bold colors, excellent for business graphics with overhead transparencies and gloss media. Broad point for shading (bar charts) and borders. Use with CalComp ClearPlot®, gloss, translucent, 22# bond and vellum E.
Plastic Tip	**WPP** Series Medium .012 in./.30 mm	Inexpensive and disposable. Vivid bold colors, excellent for business graphics with overhead transparencies and gloss media. Medium point for clear sharp lines for annotation. Use with CalComp ClearPlot®, gloss and 100% rag.
Liquid Ball Point	**WB** Series Medium .012 in/.30 mm	Disposable. Good dense lines, excellent for checkplotting. Use with translucent, 100% rag, 22# bond and gloss.
Liquid Ink (Disposable)	**WL** Series WL2-Ex Fine .010 in/.25 mm WL3-Fine .014 in/.35 mm WL4-Medium .020 in/.50 mm WL5-Broad .028 in./.70 mm	Convenient and disposable liquid ink for final high quality drawings with no ink handling. Vivid bold colors, use with translucent, 22# bond, 100% rag, vellum E and vellum 1411.
Liquid Ink (Disposable)	**WT** Series WT2-Ex Fine .010 in/.25 mm WT3-Fine .014 in/.35 mm WT4-Medium .020 in/.50 mm WT5-Broad .028 in/.70 mm	Convenient and disposable liquid ink for final high quality drawings with no ink handling. Use with polyester film.
Liquid Ink (Conventional)	**7L, 7T** Series	Reusable liquid ink tips for very dense lines for the highest quality final drawings. Use with translucent, 22# bond, 100% rag, vellum E, vellum 1411, and polyester film. Use 7L Series tips with paper and vellums. Use 7T Series tips with polyester film.

ADDENDUM A
DEFAULT AND USER PARAMETER CHART

INTRODUCTION

The 16 set-up features that make up the user parameters are described in complete detail in Chapter Six.

This chart is for your convenience to record the changes that you make to the original default values for any of the parameters.

The chart lists the original default value and provides space for recording values in each of the four user memory locations.

Where explanatory notes are needed, they are shown in the default column and explained below. For purpose of this explanation the default value referred to is the original firmware established value prior to any operator intervention.

NOTES FOR THE DEFAULT AND USER PARAMETER CHART

	SET-UP FUNCTION	REMARKS
0	Selecting User Number	Power-on default is always to the last user that was selected prior to the previous power-off.
2	Mirroring	Original default is with both X and Y OFF.
3	Plot Alignment or Deskew	No default value exist for this setup.
4	Media Compensation	Original default is for zero compensation.
5	Changing Pen Parameters	The default value will depend upon the type of pen installed. A chart showing default values for each pen type is in Chapter Six.
7	Host Communications	Default values shown are for RS-232-C interfacing. Other interface parameters may vary. See Chapter Two for additional detail.
8	Auto Logon Message	Operator established. No meaningful original default exist for this setup.
9	Send Message	Operator established. No meaningful original default exist for this setup.
10	Select Media Type	Original default will depend upon plotter model. A 1042GT and 1043GT will default to cut sheet. A 1044GT will default to roll feed.
11	Select Plotter Type	Original value established at installation or when EEPROM is initialized.
14	Initialize EEPROM	No default value exist for this setup.

FUNCTIONAL DESCRIPTION OF SET-UP AND NUMBER	DEFAULT DISPLAY
Selecting User Number 1 through 4 Set-Up 0	User Number: 1
Setting Plot Scale and Rotation Set-Up 1	Scale = 0001 to 0001 Rotate = 000
Turn On/Off Plot Mirroring Set-Up 2	Mirroring: X = OFF Y = OFF
Setting Media Alignment (Deskew) Set-Up 3	See Notes
Setting Media Compensation Set-Up 4	See Notes
Setting Pen Parameters Set-Up 5	See Notes
Setting Pen Parameters For Pen 1	Pen 1 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 2	Pen 2 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 3	Pen 3 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 4	Pen 4 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 5	PEN 5 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 6	PEN 6 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 7	PEN 7 Timeout = 000 PF = 00,Vm = 00,G = 00/10
Setting Pen Parameters For Pen 8	PEN 8 Timeout = 000 PF = 00,Vm = 00 G = 00/10
Setting Message Display Viewing Angle Set-Up 6	LCD Viewing Level Angle: 8

	USER MEMORY No. 1	USER MEMORY No. 2	USER MEMORY No. 3	USER MEMORY No. 4
Set-Up 0				
Set-Up 1				
Set-Up 2				
Set-Up 3				
Set-Up 4				
Set-Up 5				
Pen 1				
Pen 2				
Pen 3				
Pen 4				
Pen 5				
Pen 6				
Pen 7				
Pen 8				
Set-Up 6				

FUNCTIONAL DESCRIPTION OF SET-UP AND NUMBER	DEFAULT DISPLAY	
Setting Host Communication Parameters Set-Up 7	See Notes	
Setting Host Communication Parameters For Parity and Bits/Char, Menu 0	Par:0 = no,1 = 0,2 = E Bits/Char: 7/8	0 8
Setting Host Communication Parameters For Stop Bits and Clock, Menu 1	Stop Bits: 1/2 Clock 0 = Int,I = EXT	1 0
Setting Host Communication Parameters For Interface, Menu 2	0 = Serial,1 = IEEE488:0 IEEE488 Address:	 00
Setting Host Communication Parameters For Host Baud and Mode, Menu 3	Host Baud Rate: Mode: 1 = 960,0-PCI	09600 0
Setting Host Communication Parameters For Muting and Checksum, Menu 4	Term Muting Y/N? Cksum Enable Y/N?	No YES
Setting Host Communication Parameters For Isochronous and EOM, Menu 5	Isochronous Y/N? End of Mess. Chr	No 03
Setting Host Communication Parameters Direct Control and XON/XOFF, Menu 6	Direct Cntrl Y/N? XON/XOFF Y/N?	No No
Setting Host Communication Parameters For Terminal Baud Rate and Duplex, Menu 7	Term Baud Rate: Dplx:1 = half,0 = full Turnaround Code:	09600 0 00
Setting Host Communication Parameters For Sync Codes and Values, Menu 8	Sync Codes: 1/2 Sync Code Value:	1 02

	USER MEMORY No. I	USER MEMORY No. 2	USER MEMORY No. 3	USER MEMORY No. 4
Set-Up 7				
Menu 0				
Menu 1				
Menu 2				
Menu 3				
Menu 4				
Menu 5				
Menu 6				
Menu 7				
Menu 8				

FUNCTIONAL DESCRIPTION OF SET-UP AND NUMBER	DEFAULT DISPLAY
Creating Auto Logon Programmed Messages Set-Up 8	See Notes
Creating Auto Logon Programmed Messages For Programmed Message Number 1	A <0065> 1 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 2	A <0065> 2 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 3	A <0065> 3 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 4	A <0065> 4 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 5	A <0065> 5 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 6	A <0065> 6 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 7	A <0065> 7 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 8	A <0065> 8 001 000 232
Creating Auto Logon Programmed Messages For Programmed Message Number 9	A <0065> 9 001 000 232
Sending Auto Logon Messages Set-Up 9	Send Message: 1
Selecting Media Type Set-Up 10	See Notes
If 1043GT	Media? 0 Cut = 0 Roll-15" = 1, 36 = 2
If 1042GT	Media? 0 Cut = 0 Roll-15 = 1,36 = 2, Dis = 3
If 1044GT	Media? 2 Cut = 0 Roll-15" = 1, 36" = 2

	USER MEMORY No. 1	USER MEMORY No. 2	USER MEMORY No. 3	USER MEMORY No. 4
Set-Up 8				
Msg. 1				
Msg. 2				
Msg. 3				
Msg. 4				
Msg. 5				
Msg. 6				
Msg. 7				
Msg. 8				
Msg. 9				
Set-Up 9				
Set-Up 10				
If 1043GT				
If 1042GT				
If 1044GT				

FUNCTIONAL DESCRIPTION OF SET-UP AND NUMBER	DEFAULT DISPLAY
Displaying Plotter Model Set-Up 11	
If Model 1042GT	Plotter Model 1042
If Model 1043GT	Plotter Model 1043
If Model 1044GT	Plotter Model 1044
Selection of English (Inches) or Metric (Centimeters) Display Set-Up 12	Units: 0 ENG,1 Met 0
Entering Drum Scale Factor Compensation Set-Up 13	SF:X = 256,Y = 256 See Notes
Entering Drum Scale Factor Compensation If Grit 15 Drum (1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Grit 28 Drum (1043GT/1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Grit 30 Drum (1043GT/1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Grit 33 Drum (1043GT/1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Grit 34 Drum (1043GT/1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Grit 36 Drum (1043GT/1042GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Sprocket 15 Drum (1044GT Only)	SF:X = ,Y =
Entering Drum Scale Factor Compensation If Sprocket 36 Drum (1044GT Only)	SF:X = ,Y =

	USER MEMORY No. 1	USER MEMORY No. 2	USER MEMORY No. 3	USER MEMORY No. 4
Set-Up 11				
If 1042GT				
If 1043GT				
If 1044GT				
Set-Up 12				
Set-Up 13				
G-15				
G-25				
G-28				
G-30				
G-33				
G-34				
G-36				
S-15				
S-36				

FUNCTIONAL DESCRIPTION OF SET-UP AND NUMBER	DEFAULT DISPLAY	
EEPROM Initialization Set-Up 14	See Notes	
Selecting Display Message Language Set-Up 15	See Notes	
Selecting Display Message Language If English Language is Selected	Language used Press Next for menu	0
Selecting Display Message Language If Katakana Language is Selected	Language used Press Next for menu	1
Selecting Display Message Language If French Language is Selected	Language used Press Next for menu	2
Selecting Display Message Language If Italian Language is Selected	Language used Press Next for menu	3
Selecting Display Message Language If German Language is Selected	Language used Press Next for menu	4
Turn ON/OFF Plot Management Set-Up 16	Enable Optimization Yes or No:	YES
Setting Index Media Length Set-Up 17	Enter Index Media Length:	000

	USER MEMORY No. 1	USER MEMORY No. 2	USER MEMORY No. 3	USER MEMORY No. 4
Set-Up 14				
Set-Up 15				
Menu 0				
Menu 1				
Menu 2				
Menu 3				
Menu 4				
Set-Up 16				
Set-Up 17				

ADDENDUM B
PLOTTER/HOST COMMUNICATIONS SET-UP

INTRODUCTION

Installing CalComp's 1040 Series Plotters for use with Computer Aided Design (CAD) software running on IBM PC's is simple and takes just a few minutes. The following steps guide you through the installation of your CalComp plotter for use with any of the programs listed in Table B-1.

TABLE B-1. 1040 PLOTTER COMPATIBLE PROGRAMS

DTE HOST	DCE HOST
AUTOCAD AUTOCAD Version 2.5 AUTOCAD.PLT CADVANCE Version 1.2 PRIMAVISION VERSACAD	POINT LINE CADD

Installation consists of the following steps:

- Connecting the plotter to the PC
- Setting the switches on the plotter
- Installing the ROMPACK and turning system power ON
- Selecting the baud rate, parity, etc.
- Loading pens and media
- Loading and configuring the CAD program
- Plotting a drawing
- Removing the finished drawing

Connecting the plotter to the PC

1. Be sure that power to the plotter and to the PC is turned OFF. The power switch on the plotter is located just below the control panel (Figure B-1). The OFF position is marked by a small red zero.

2. Connect the plotter to the PC as follows:

   - DTE Host (Table B-1) — Connect the plotter to your PC's serial COM port using the CalComp supplied cable. Use the 25- to 9-pin adapter available from IBM when connecting to an IBM PC AT. You should plug the other end into the connector marked P0903 TO DTE HOST on the rear interface panel (Figures B-1 and B-2).

- DCE Host (Table B-1) — Connect the plotter to your PC's serial COM2 port using the CalComp supplied cable. Use the special cable supplied by POINT LINE when connecting to the COM2 port of the IBM PC AT. You should plug the other end into the connector marked P0902 TO DCE HOST on the rear interface panel (Figures B-1 and B-2).

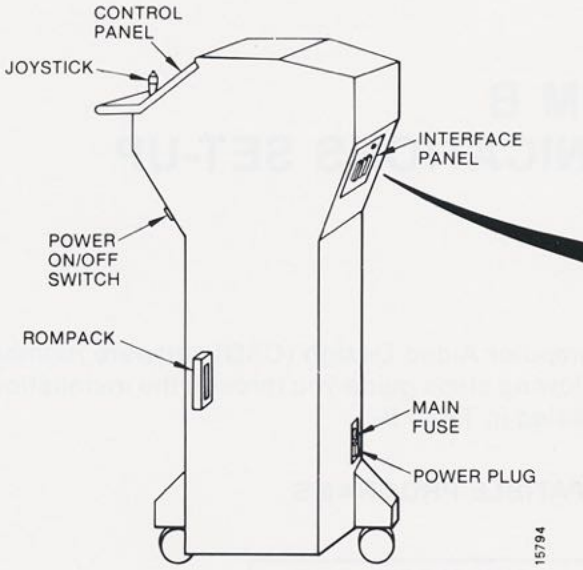
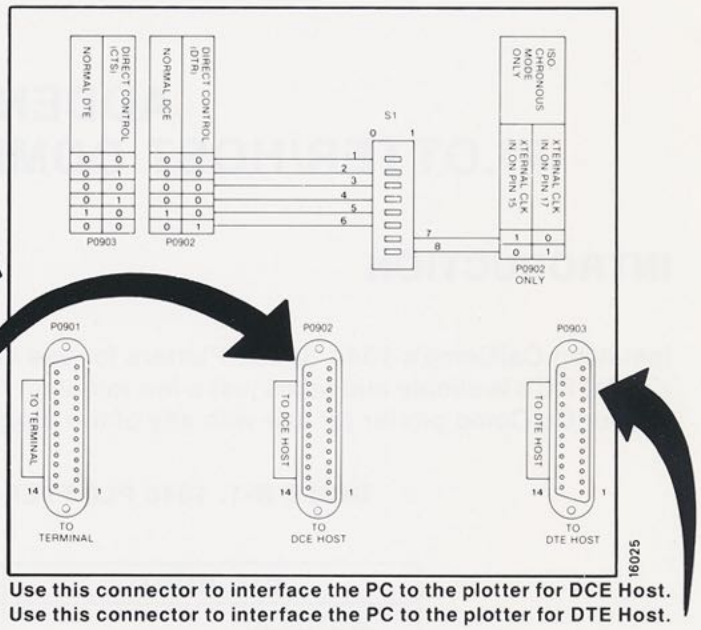


Figure B-1. Right Pedestal



Use this connector to interface the PC to the plotter for DCE Host.
Use this connector to interface the PC to the plotter for DTE Host.

Figure B-2. Plotter RS-232-C Interface Panel

TABLE B-2. 1040 PLOTTER S1 SETTINGS WHEN CONNECTED TO AN IBM PC, PC XT, PC AT USING AUTOCAD

PROGRAM	SET THESE SWITCHES* TO 1
AUTOCAD	5
AUTOCAD Version 2.5 AUTOCAD.PLT PRIMAVISION	2 and 4
POINT LINE CADD	6
VERSACAD	3
*Set all other switches to 0	

Setting the switches on the plotter

1. Set the plotter configuration switch, S1, according to Table B-2. Note that the switch is numbered 1 through 8 from top to bottom and that pressing to the left side selects a 0 (zero), while pressing to the right selects a 1 (one). The switch is located on the interface panel.

Installing the ROMPACK and turning system power ON

1. Insert the ROMPACK into the slot on the outside of the right pedestal (Figure B-1). The small key blocks on the ROMPACK pin housing face the back of the plotter.

2. Connect the power cord to an electric outlet.

3. Turn the power switch on the plotter ON.

4. Turn power to your PC system ON.

Selecting the baud rate, parity, etc.

1. After power is turned ON, the plotter performs some automatic diagnostics and initialization. The following messages are displayed momentarily.

   Copyright © 1985
   CalComp

   Turret Init
   Please Stand By

2. The plotter pauses and in a few seconds displays the following message if the safety cover is down.

   Ready
   Please Load Paper

   It displays the following if the cover is up.

   Please Lower Cover
   Please Load Paper

3. Press the SET-UP key. The plotter displays:

   Setup Number: _____
   Press NEXT for MENU

4. Press 7 then ENTER. The plotter now displays:

   Host Setup Number: _____
   Press NEXT for MENU

5. In this step, you learn how to scroll through the communications set-up menu and configure the plotter for use with AUTOCAD.

   By pressing NEXT, you can scroll through a menu of communication parameters numbered 0 (zero) through 8 (eight). The menu is circular, which means that if you press NEXT when you're at the end, it starts over. If you miss one, you can always circle back to it.

NOTE

Refer to Chapter Six, Set-Up 7 for additional information.

For example, the first time you press NEXT, the plotter displays the following:

Host Setup Number: _____
0 Parity & Bits/Char

Select a menu item by pressing the ENTER key. The following message is displayed:

Par: 0=NO, 1=0, 2=E 2 May display different numbers
Bits/Char: 7/8 7 depending on what was last saved.

The cursor is positioned under the parameter to be changed. To change the parameter, type in the new value and press ENTER. To leave it unchanged, just press ENTER. If you type in a value and make a mistake, you can erase the entry by using the CLEAR key or you can return to a previous entry by repeatedly pressing on the ENTER key.

NOTE

If the entry calls for a YES/NO answer, the plotter interprets the ENTER key as YES. The plotter accepts your input immediately.

When done, use the NEXT key to go on the the next Host Setup Number.

6. Now that you've learned how to set the plotter communication parameters, you're ready to configure the plotter for use with AUTOCAD.

   Use the NEXT key to return to Host Setup Number 0 (zero), Parity & Bits/Char. Use the procedure in step 5, above, to set the communication parameters per Table B-3.

7. When done setting the communication parameters, press the AUTO/MANUAL key twice.

8. At this point you may wish to save these parameters in nonvolatile memory. To do so, press the SET-UP key followed by the SAVE key, type the user number (1, 2, 3 or 4), and press ENTER. Press RESET, then press YES. This ensures that the newly saved Host Setup parameters are applied.

NOTE

Refer to Chapter Six, Set-Up 7 for additional information.

Loading pens and media

1. Remove the pen turret from the plotter and insert the desired pens. Don't forget to remove the protective cap from the pen. The easiest way to load a pen is to insert the tip into the small rubber cap designed to keep the pen tip from drying out, push down gently, and rotate the pen body into the holder (Figure B-3). Place the turret back on the plotter; give it a half turn and it drops into place.

CAUTION

The plotter ships with two different colored rubber pen caps — beige (tan) and black. Refer to Chapter One, Pen Turret Installation, for more detail.

2. Insert a sheet of paper between the pinch rollers and the drum (Figure B-3). Align the right edge of the paper with the alignment mark on the platen (Figure B-4).

TABLE B-3. PLOTTER SET-UP 7, COMMUNICATIONS MENU

Menu	AUTOCAD & AUTOCAD 2.5	CADVANCE	POINT LINE CADD	PRIMAVISION	VERSACAD	AUTOCAD.PLT
0 PAR= BITS/CHAR=	2 7	0 8	0 8	0 8	0 8	2 7
1 STOP BITS= CLOCK=	1 0	1 0	2 0	1 0	1 0	1 0
2 INTERFACE=	0	0	0	0	0	0
3 HOST BAUD RATE= MODE=	9600 0	9600* 0	2400 0	9600 0	9600 0	9600 0
4 TERM MUTING= CHECKSUM ENABLE=	N Y	N N	Y N	N Y	N N	N Y
5 ISOCHRONOUS= END OF MESSAGE	N 13	N 03	N 03	N 03	N 13	N 13
6 DIRECT CONTROL= XON/XOFF	N N	Y N	Y N	Y N	N Y	Y N
7 TERM BAUD RATE= DUPLEX=	9600 0	9600 0	9600 0	9600 0	9600 0	9600 0
8 SYNC CODE= SYNC CODE VALUE=	2 022	1 02	1 022	1 02	2 126	2 022

* If using a modem, set the host baud rate to match the modem setting.

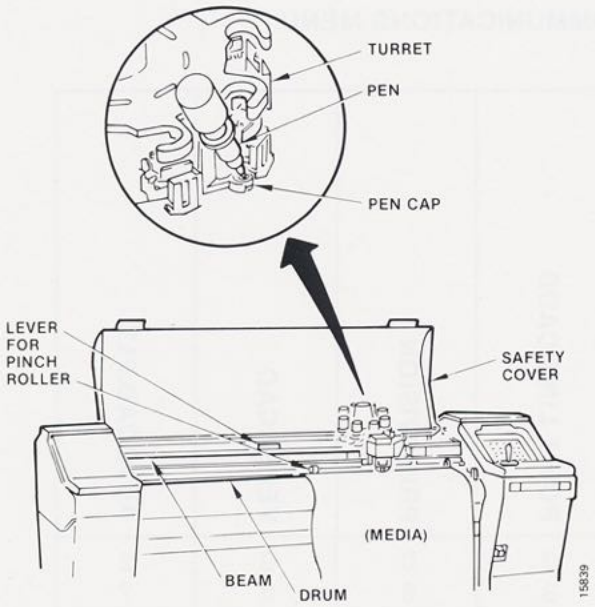


Figure B-3. Pens, Turret and Media

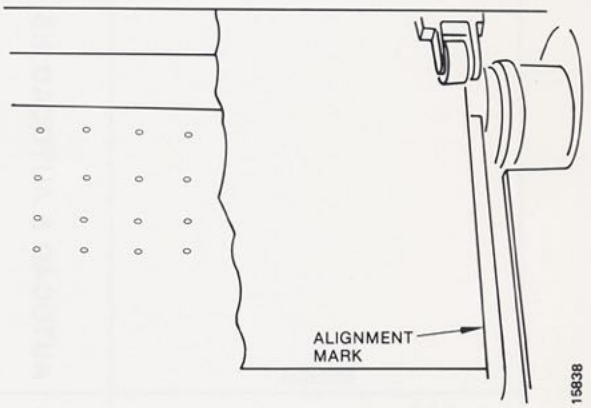


Figure B-4. Media Alignment

Loading and configuring CAD program

- AUTOCAD

  1. Load AUTOCAD on your PC.

  2. Ensure that AUTOCAD is configured the same way that you set up the plotter. Set the plotter type to CalComp 906/907/PCI. If you are using AUTOCAD 2.0 or 2.1, set the step size to .001. If you are using AUTOCAD 2.15, set the steps per inch to 2032.

  3. Be sure that you have connected the plotter to the right COM port.

- AUTOCAD (using .PLT files)

  1. Load AUTOCAD on your PC.

  2. Ensure that AUTOCAD is configured the same way that you set up the plotter. Set the plotter type to CalComp 906/907/PCI.

     a. Select XON/XOFF = Yes.

     b. Select plot to file = Yes.

     c. Create .PLT files (plot files) from within AUTOCAD.

  3. Be sure that you've connected the plotter to the correct COM port.

  4. On your PC, set the MODE as follows:

     ```
     MODE LPT1:=COM1:
     MODE COM1: 9600, E, 7, 1
     PRINT filename.PLT
     ```

NOTE

COM1: must be replaced with COM2: if you are connected to COM2.

- CADVANCE

  1. Load CADVANCE on your PC.
  2. Be sure that you have connected the plotter to the correct COM port.

- POINT LINE CADD

  1. Load POINT LINE on your PC.
  2. Be sure that you have connected the plotter to the correct COM port (COM port 2).
  3. Be sure the hard-copy menu indicates CalComp.

- PRIMAVISION

  1. Install P3 and PRIMAVISION according to installation documentation supplied with P3.
  2. SETPLOT.BAT should be edited to define COM1 port as follows: COM1:9600, N, 8, 1, P
  3. "BOOT UP" under P3 and then exit.
  4. Type in SETPLOT at prompt C:\P3>SETPLOT
  5. Type PV to enable PRIMAVISION C:\PE>PV
  6. Select 9 (configure system)
     Type E (edit)

     Select plotter type 1
     Select COM1
     "END" key to exit edit
     Type R (return to menu)

  7. Select 2 (time scaled logic diagram)

     Type HOME

  8. Select N (next)

     Type 01

  9. Select X (execute)
  10. Answer next two questions Y (yes)

      Plotting should begin

- VERSACAD

1. Load VERSACAD on your PC.
2. Be sure you have configured the VERSACAD ENVIRO for the CalComp plotter.
3. Be sure that you have connected the plotter to the correct COM port.

Plotting a CAD program drawing

1. Select plot drawing using the CAD program master menu.
2. Use CAD program to map pens or scale the drawing as desired.
3. Press RETURN when ready to plot as prompted by CAD program. The plotter begins plotting within a few seconds.

Removing the finished drawing

1. When the drawing is finished, the plotter pauses and the plot time display stops.
2. To unload the drawing press AUTO/MANUAL followed by LOAD/UNLOAD.
3. Raise the cover.
4. Remove the drawing simply by holding it by the front edge and pulling it toward you.

NOTE

A comprehensive list of format parameters for other software packages is detailed in Table B-4.

TABLE B-4. PCI FORMAT PARAMETERS

Name	Baud Rate	Byte Length	Stop Bits	Parity	Hand-shake	Sync Char	Number Sync	End Message	Checksum
ANVILL-1000	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
ARCOS	4800	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CADCOM	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CADDY	9600	7 bit	1	even	Direct Control	22	2	13	Enabled
CADKEY (prior 3.1)	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
CADKEY (after 3.1)	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Disabled
CADLINC	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
CADMASTER	9600	8 bit	1	none	ACK/ Nak	2	1	3	Enabled
CADPLUS	9600	7 bit	1	even	Direct Control	2	1	3	Disabled
CASCADE	9600	8 bit	1	none	Direct Control	2	1	13	Disabled
CAED CADD2000	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CIVIL SOFT (Prior 11/86)	9600	8 bit	1	none	ACK/ NAK	2	2	3	Disabled
CIVIL SOFT (After 11/86)	9600	8 bit	1	none	Direct Control	2	2	3	Disabled
DATACAD (Prior 3.0)	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
DATACAD (After 3.0)	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
DIAD	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
DOGS	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Enabled
EASY- DRAFT MACINTOSH	9600	8 bit	1	none	ACK/ NAK	22	2	13	Enabled

TABLE B-4. PCI FORMAT PARAMETERS (Cont.)

Name	Baud Rate	Byte Length	Stop Bits	Parity	Hand-shake	Sync Char	Number Sync	End Message	Checksum
EASY-DRAFT NEC	9600	8 bit	1	none	ACK/ NAK	2	2	13	Enabled
EE DESIGNER	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
GEOCAM	9600	7 bit	1	none	ACK/ NAK	22	2	13	Disabled
IGOS	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MACPLOT	9600	7 bit	1	even	Direct Control	85	2	13	Disabled
MCAD	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MEDUSA	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MICRO CADAM	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
MICRO-STATION	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
MINICAD	9600	7 bit	1	even	Direct Control	2	1	3	Disabled
ORCAD	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
PALETTE	2400	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
PROCAD	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
PRO DESIGN II	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
CS-1	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
ROAD-CALC	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
VERSACAD (after 5.3)	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Disabled

ADDENDUM C
MATERIAL SAFETY DATA SHEETS (MSDS)

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No. 1218-0074
Expiration Date 05/31/86

Name of Product: GP - Inks (All Colors)

Section I

Manufacturer's Name: CALCOMP, A Lockheed Company

Harbor Medical clinic
First Aid Only

Emergency Telephone Number: (714) 991-5002

Address (Number, Street, City, State, and ZIP Code): 2411 W. LaPalma Avenue
Anaheim, CA 92801

Chemical Name and Synonyms: Drawing Ink

Trade Name and Synonyms: 3089-Colored

Chemical Family: Drawing Ink

Formula: PROPRIETARY

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments	12-20		Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents	10		Filler Metal Plus Coating or Core Flux		
Additives	2		Others		
Others	1				

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)

Section III - Physical Data

Boiling Point (°F)	216	Specific Gravity (H_2O=1)	1.08
Vapor Pressure (mm Hg)	N/A	Percent Volatile by Volume (%)	70-80
Vapor Density (AIR=1)	N/A	Evaporation Rate (_____ =1)	

Solubility in Water: 80-88%

Appearance and Odor: Colored liquid, feeble ordor as amonia

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
NONE			

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

F0080-326 (4/87)

Section V - Health Hazard Data

Threshold Limit Value: 100 ppm; 260 mg/m^3

Effects of Overexposure: Harmful if swallowed

Emergency First Aid Procedures

Eye contact: Rinse with plenty of water and seek medical advice

Ingention: Provoke vomiting, when greater quantities swallowed

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatability (Materials to Avoid)

Hazardous Decomposition Products

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Spill away with water

Waste Disposal Method

Domestic dumping place

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves	Eye Protection

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Keep from Freezing

Other Precautions

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No 1218-0074
Expiration Date 05/31/86

CONCENTRATE PEN CLEANER

Section I

Manufacturer's Name: CALCOMP, A Lockheed Company

Address (Number, Street, City, State, and ZIP Code): 2411 W. La Palma Avenue, Anaheim, CA 92801

Harbor Medical Clinic
First Aid Only

Emergency Telephone Number: (714) 991-5002

Chemical Name and Synonyms:

Trade Name and Synonyms: 3068 pen cleaner

Chemical Family: Alkaline detergent solution

Formula: Proprietary

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments			Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents: Ethanolamine	5		Filler Metal Plus Coating or Core Flux		
Additives: Potassium hydroxide	1		Others		
Others: Triton X-100	5				

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
CAS numbers: Ethanolamine 141-43-5; Potassium hydroxide 1310-58-3;		
Triton X-100 9002-93-1 (see further information at bottom of page)		
Triton X-100 is manufactured by Rohm & Haas Co., Independence Mall W. Philadelphia, PA 19105		

Section III - Physical Data

Boiling Point (°F)	230 F.	Specific Gravity (H_2O=1)	1.024
Vapor Pressure (mm Hg) Like water		Percent Volatile by Volume (%)	89.4
Vapor Density (AIR=1) Like water		Evaporation Rate (_____=1) Like water	

Solubility in Water: miscible

Appearance and Odor: White turbid liquid - mild soap odor

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
186 F. ASTM D56			

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards: *(further info on Triton X-100) Triton X-100 shares this CAS number with other Triton X's and GAF Igepal CA630, and GAF Antarox A-200. It also goes under the names Octoxynol and Octylphenoxy polyethoxyethanol, among others.

F0060-332 (4/87)

Section V - Health Hazard Data

Threshold Limit Value

Unknown

Effects of Overexposure

Liquid will irritate broken skin

Emergency First Aid Procedures

If swallowed use general procedure for strong alkalies

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable X		

Incompatability (Materials to Avoid)

Hazardous Decomposition Products

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur X		

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Rinse with water

Waste Disposal Method

Standard sewage procedures

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves	Eye Protection

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Extreme heat or cold may cause stratification which disappears at room temperature -- glass bottles may break if frozen.

Other Precautions

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No 1218-0074
Expiration Date 05/31/86

DISPOSABLE LIQUID INK PEN
(DL and WL Series)

Section I

Manufacturer's Name: CALCOMP, A Lockheed Company

Address (Number, Street, City, State, and ZIP Code): 2411 W. La Palma Avenue, Anaheim, CA 92801

Harbor Medical Clinic
First Aid Only

Emergency Telephone Number: (714) 991-5002

Chemical Name and Synonyms:

Trade Name and Synonyms: Disposable Pen - all colors

Chemical Family: Drawing Ink

Formula: Proprietary

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments: Dyestuff	6.5-7		Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents			Filler Metal Plus Coating or Core Flux		
Additives			Others		
Others: Phenyl (62-38-4) Mercury Acetate	0.6	.01mg/m^3			

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
Contains water based ink, non toxic as defined by Hazardous substances		
Act. LD50 greater than 5g/kg body weight.		

Section III - Physical Data

Boiling Point (°F)	212	Specific Gravity (H_2O=1)	1.034 - 1.05
Vapor Pressure (mm Hg)	20	Percent Volatile by Volume (%)	87-92
Vapor Density (AIR=1)	0.62	Evaporation Rate (_____=1)	0.9-0.96

Solubility in Water: miscible

Appearance and Odor: Colored liquid, faint odor

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
(ASTM D56) None to boiling			

Extinguishing Media: Dry chemicals, CO_2, water or foam

Special Fire Fighting Procedures: none

Unusual Fire and Explosion Hazards: Unknown

F0080-333 (4/87)

Section V - Health Hazard Data

Threshold Limit Value

Not established

Effects of Overexposure

None known

Emergency First Aid Procedures

Flush eyes with plenty of water. Wash skin with soap and water.

If ingested, get medical attention.

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable x		none

Incompatability (Materials to Avoid)

Contact with strong oxidizing agents will cause powerful reaction.

Hazardous Decomposition Products

None expected

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur x		none

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Do not allow ink to dry--rinse at once with water and wash with soap. If ink has dried, soak first with Koh-I-Noor #3068. Denatured and rubbing alcohols may be useful.

Waste Disposal Method

1. Standard sewage procedure -- flush with plenty of water

2. Place in waste disposal receptacle

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

None required

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves	Eye Protection

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Expansion due to freezing may cause leakage--store above 32°F.

Other Precautions

None

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No. 1218-0074
Expiration Date 05/31/86

DISPOSABLE LIQUID INK PEN - BLACK
(DL and WL Series)

Section I

Manufacturer's Name: CALCOMP, A Lockheed Company

Harbor Medical Clinic
First Aid Only

Emergency Telephone Number: (714) 991-5002

Address (Number, Street, City, State, and ZIP Code): 2411 W. LaPalma Avenue, Anaheim, CA 92803

Chemical Name and Synonyms: Mixture

Trade Name and Synonyms: Disposable Pen - black

Chemical Family: Drawing Ink

Formula: PROPRIETARY

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments: Carbon Black 1333-86-4	6		Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents: Alcohol 64-17-5	1.6	1000 ppm	Filler Metal Plus Coating or Core Flux		
Additives			Others		
Others					

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
Contains water based ink, non-toxic as defined by Hazardous Substances Act.		
LD 50 greater than 5g/Kg body weight.		

Section III - Physical Data

Boiling Point (°F)	210	Specific Gravity (H_2O=1)	1.064
Vapor Pressure (mm Hg)	Unknown	Percent Volatile by Volume (%)	91.9
Vapor Density (AIR=1)	Unknown	Evaporation Rate (H_2O =1)	1.0

Solubility in Water

Appearance and Odor: Black liquid, odor from ingredient combination.

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
ASTM D56 154°			

Extinguishing Media: Will not sustain flame.

Special Fire Fighting Procedures: None

Unusual Fire and Explosion Hazards: None

F0080-334 (4/87)

Section V - Health Hazard Data

Threshold Limit Value

Not Established

Effects of Overexposure

Unknown

Emergency First Aid Procedures

Flush eyes with plenty of water. Wash skin with soap and water.

If ingested, get medical attention.

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	None

Incompatability (Materials to Avoid)

Strong Oxidizing Agents

Hazardous Decomposition Products

None Expected

Hazardous Polymerization	May Occur		Conditions to Avoid None
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Do not allow to dry - rinse at once with water and wash with soap.

If ink has dried, soak first with Koh-I-Noor 3068 cleaning solution.

Waste Disposal Method

(1) Standard sewage procedure

(2) Place in waste disposal receptacle

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Ventilation None	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves	Eye Protection

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Avoid freezing which may cause ink leakage.

Other Precautions

Material Safety Data Sheet

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

U.S. Department of Labor

Occupational Safety and Health Administration

OMB No 1218-0074
Expiration Date 05/31/86

Name of Product: IGP - Black Ink

Section I

Manufacturer's Name: CALCOMP, A Lockheed Company

Address (Number, Street, City, State, and ZIP Code): 2411 W. LaPalma Avenue, Anaheim, CA 92803

Harbor Medical Clinic
First Aid Only

Emergency Telephone Number: (714) 991-5002

Chemical Name and Synonyms:

Trade Name and Synonyms: 3080FCC-Black

Chemical Family: Drawing Ink

Formula: PROPRIETARY

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments: Furnace Black	7.2		Base Metal		
Catalyst			Alloys		
Vehicle: Water	80		Metallic Coatings		
Solvents			Filler Metal Plus Coating or Core Flux		
Additives: Ammonium Hydroxide	1		Others		
Others: Phenol	0.5				

Hazardous Mixtures of Other Liquids, Solids or Gases

	%	TLV (Units)
Ethylene Glycol	1.6	
Methyl Carbitol	1.4	

Section III - Physical Data

Boiling Point (°F)	213°F	Specific Gravity (H_2O=1)	1.055
Vapor Pressure (mm Hg)	Like Water	Percent Volatile by Volume (%)	82
Vapor Density (AIR=1)	Like Water	Evaporation Rate (_____=1)	Faster than water

Solubility in Water: Good

Appearance and Odor: Black liquid

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	168°F	Flammable Limits	Lel	Uel

Extinguishing Media

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards

F0080-327 (4/87)

Section V - Health Hazard Data

Threshold Limit Value

Effects of Overexposure

Burns tongue and eyes

Emergency First Aid Procedures

Small quantities taken erroneously are harmless-

Check with Physician

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatability (Materials to Avoid)

Hazardous Decomposition Products

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Don't allow to dry-rinse with cold water by regular laundry or dry cleaning

Blot...do not rub soiled material

Waste Disposal Method

Standard sewage procedures

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Ventilation	Local Exhaust	Special
	Mechanical (General)	Other

Protective Gloves	Eye Protection

Other Protective Equipment

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Do not freeze - leakage may occur

Other Precautions

BIBLIOGRAPHY

The following CalComp publications relate to material included in the 1040GT Series User's Guide. Copies may be purchased from CalComp.

- Guide to Liquid Inking Procedures For CalComp 9X5A, 1070, 1040 and 1040GT Series Intelligent Plotters. Contains application and preventive maintenance information liquid ink and plot media.
- 1040GT Series Drum Plotter Maintenance. Contains Installation, Theory of Operation, and Maintenance information.
- 1040GT Series Drum Plotter Engineering Drawings. Comprised of drawings that are frequently used in the maintenance and support of the plotter.
- 1040GT Series Drum Plotter Field Parts Catalog. Comprised of drawings that are frequently used to obtain replacement parts information to the lowest repairable level.

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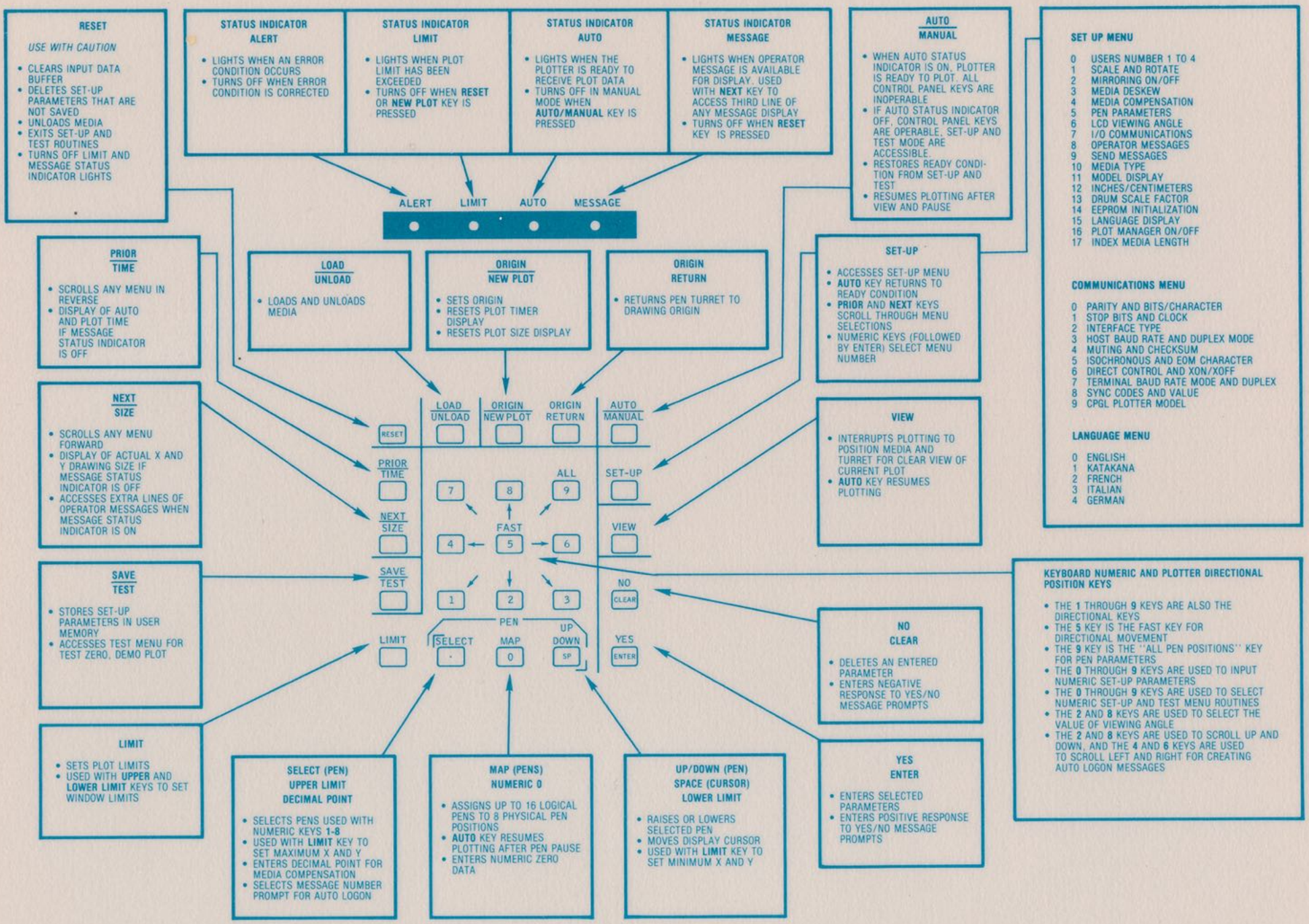
RESET
USE WITH CAUTION
• CLEARS INPUT DATA BUFFER
• DELETES SET-UP PARAMETERS THAT ARE NOT SAVED
• UNLOADS MEDIA
• EXITS SET-UP AND TEST ROUTINES
• TURNS OFF LIMIT AND MESSAGE STATUS INDICATOR LIGHTS
STATUS INDICATOR ALERT
• LIGHTS WHEN AN ERROR CONDITION OCCURS
• TURNS OFF WHEN ERROR CONDITION IS CORRECTED
STATUS INDICATOR LIMIT
• LIGHTS WHEN PLOT LIMIT HAS BEEN EXCEEDED
• TURNS OFF WHEN RESET OR NEW PLOT KEY IS PRESSED
STATUS INDICATOR AUTO
• LIGHTS WHEN THE PLOTTER IS READY TO RECEIVE PLOT DATA
• TURNS OFF IN MANUAL MODE WHEN AUTO/MANUAL KEY IS PRESSED
STATUS INDICATOR MESSAGE
• LIGHTS WHEN OPERATOR MESSAGE IS AVAILABLE FOR DISPLAY. USED WITH NEXT KEY TO ACCESS THIRD LINE OF ANY MESSAGE DISPLAY
• TURNS OFF WHEN RESET KEY IS PRESSED
AUTO MANUAL
• WHEN AUTO STATUS INDICATOR IS ON, PLOTTER IS READY TO PLOT. ALL CONTROL PANEL KEYS ARE INOPERABLE
• IF AUTO STATUS INDICATOR OFF, CONTROL PANEL KEYS ARE OPERABLE, SET-UP AND TEST MODE ARE ACCESSIBLE.
• RESTORES READY CONDITION FROM SET-UP AND TEST
• RESUMES PLOTTING AFTER VIEW AND PAUSE
SET UP MENU
0 USERS NUMBER 1 TO 4
1 SCALE AND ROTATE
2 MIRRORING ON/OFF
3 MEDIA DESKEW
4 MEDIA COMPENSATION
5 PEN PARAMETERS
6 LCD VIEWING ANGLE
7 I/O COMMUNICATIONS
8 OPERATOR MESSAGES
9 SEND MESSAGES
10 MEDIA TYPE
11 MODEL DISPLAY
12 INCHES/CENTIMETERS
13 DRUM SCALE FACTOR
14 EEPROM INITIALIZATION
15 LANGUAGE DISPLAY
16 PLOT MANAGER ON/OFF
17 INDEX MEDIA LENGTH
COMMUNICATIONS MENU
0 PARITY AND BITS/CHARACTER
1 STOP BITS AND CLOCK
2 INTERFACE TYPE
3 HOST BAUD RATE AND DUPLEX MODE
4 MUTING AND CHECKSUM
5 ISOCHRONOUS AND EOM CHARACTER
6 DIRECT CONTROL AND XON/XOFF
7 TERMINAL BAUD RATE MODE AND DUPLEX
8 SYNC CODES AND VALUE
9 CPGL PLOTTER MODEL
LANGUAGE MENU
0 ENGLISH
1 KATAKANA
2 FRENCH
3 ITALIAN
4 GERMAN
ALERT
LIMIT
AUTO
MESSAGE
PRIOR TIME
• SCROLLS ANY MENU IN REVERSE
• DISPLAY OF AUTO AND PLOT TIME IF MESSAGE STATUS INDICATOR IS OFF
LOAD UNLOAD
• LOADS AND UNLOADS MEDIA
ORIGIN NEW PLOT
• SETS ORIGIN
• RESETS PLOT TIMER DISPLAY
• RESETS PLOT SIZE DISPLAY
ORIGIN RETURN
• RETURNS PEN TURRET TO DRAWING ORIGIN
SET-UP
• ACCESSES SET-UP MENU
• AUTO KEY RETURNS TO READY CONDITION
• PRIOR AND NEXT KEYS SCROLL THROUGH MENU SELECTIONS
• NUMERIC KEYS (FOLLOWED BY ENTER) SELECT MENU NUMBER
NEXT SIZE
• SCROLLS ANY MENU FORWARD
• DISPLAY OF ACTUAL X AND Y DRAWING SIZE IF MESSAGE STATUS INDICATOR IS OFF
• ACCESSES EXTRA LINES OF OPERATOR MESSAGES WHEN MESSAGE STATUS INDICATOR IS ON
VIEW
• INTERRUPTS PLOTTING TO POSITION MEDIA AND TURRET FOR CLEAR VIEW OF CURRENT PLOT
• AUTO KEY RESUMES PLOTTING
SAVE TEST
• STORES SET-UP PARAMETERS IN USER MEMORY
• ACCESSES TEST MENU FOR TEST ZERO, DEMO PLOT
LIMIT
• SETS PLOT LIMITS
• USED WITH UPPER AND LOWER LIMIT KEYS TO SET WINDOW LIMITS
SELECT (PEN)
UPPER LIMIT
DECIMAL POINT
• SELECTS PENS USED WITH NUMERIC KEYS 1-8
• USED WITH LIMIT KEY TO SET MAXIMUM X AND Y
• ENTERS DECIMAL POINT FOR MEDIA COMPENSATION
• SELECTS MESSAGE NUMBER PROMPT FOR AUTO LOGON
MAP (PENS)
NUMERIC 0
• ASSIGNS UP TO 16 LOGICAL PENS TO 8 PHYSICAL PEN POSITIONS
• AUTO KEY RESUMES PLOTTING AFTER PEN PAUSE
• ENTERS NUMERIC ZERO DATA
UP/DOWN (PEN)
SPACE (CURSOR)
LOWER LIMIT
• RAISES OR LOWERS SELECTED PEN
• MOVES DISPLAY CURSOR
• USED WITH LIMIT KEY TO SET MINIMUM X AND Y
NO CLEAR
• DELETES AN ENTERED PARAMETER
• ENTERS NEGATIVE RESPONSE TO YES/NO MESSAGE PROMPTS
YES ENTER
• ENTERS SELECTED PARAMETERS
• ENTERS POSITIVE RESPONSE TO YES/NO MESSAGE PROMPTS
KEYBOARD NUMERIC AND PLOTTER DIRECTIONAL POSITION KEYS
• THE 1 THROUGH 9 KEYS ARE ALSO THE DIRECTIONAL KEYS
• THE 5 KEY IS THE FAST KEY FOR DIRECTIONAL MOVEMENT
• THE 9 KEY IS THE "ALL PEN POSITIONS" KEY FOR PEN PARAMETERS
• THE 0 THROUGH 9 KEYS ARE USED TO INPUT NUMERIC SET-UP PARAMETERS
• THE 0 THROUGH 9 KEYS ARE USED TO SELECT NUMERIC SET-UP AND TEST MENU ROUTINES
• THE 2 AND 8 KEYS ARE USED TO SELECT THE VALUE OF VIEWING ANGLE
• THE 2 AND 8 KEYS ARE USED TO SCROLL UP AND DOWN, AND THE 4 AND 6 KEYS ARE USED TO SCROLL LEFT AND RIGHT FOR CREATING AUTO LOGON MESSAGES
RESET
LOAD UNLOAD
ORIGIN NEW PLOT
ORIGIN RETURN
AUTO MANUAL
PRIOR TIME
ALL
SET-UP
NEXT SIZE
FAST
VIEW
SAVE TEST
NO CLEAR
PEN
LIMIT
SELECT
MAP
UP DOWN
YES ENTER
7
8
9
4
5
6
1
2
3
0
SP

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